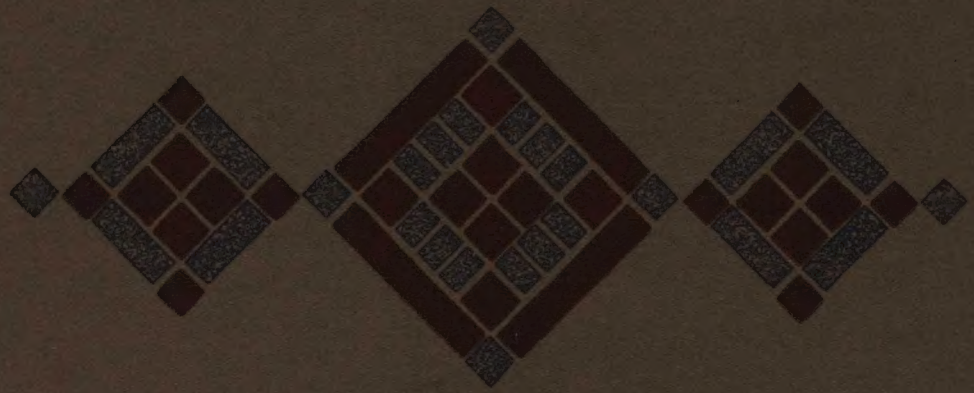
BRICK MAKING MACHINERY

CATALOGUE - 22



CHAMBERS BROTHERS COMPANY

FIFTY-SECOND AND MEDIA STREETS

PHILADELPHIA, PA.

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Established 1857 Cable Address—Chambers, Philadelphia Incorporated 1888

Brickmaking Machinery
Clay Grinding and Mixing Machines

Catalogue No. 22

CHAMBERS BROTHERS COMPANY

Fifty-Second and Media Streets

PHILADELPHIA, PA., U. S. A.

J. H. CHAMBERS, President and Gen'l Manager
S. B. CHAMBERS, Secretary and Treasurer
H. K. KING, Mechanical Engineer
W. G. TAYLOR, JR., Manager Supply Dept.

Salesmen :

A. R. ROOT { Eastern District
Philadelphia Office

L. S. MORRISON { Southern District
Healey Bldg., Atlanta, Ga.

E. G. BIECHLER { Middle West
549 W. Washington Blvd , Chicago, Ill.

Main Office and Works—Fifty-second and Media Streets
Philadelphia, Pa.

Take Subway west on Market Street to Fifty-second, north on Fifty-second to corner of Media Street. Or take local train, Broad Street or West Philadelphia Stations of Pennsylvania Railroad, to Fifty-second Street. Works two blocks south of station.

We value visits from our customers or others using Clay Working Machinery. Their inspection and criticism of our machines during construction is cordially invited.

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CYRUS CHAMBERS, JR., Inventor

Founder of the business of Chambers Brothers Company

The Chambers Brickmaking Machinery

FOREWORD

For over fifty years our establishment has been devoted to this specialty. During a large portion of this time the present management has been identified with the business, being responsible for most of our present designs built upon the principles founded by the late Cyrus Chambers, Jr. That our machinery is to-day the recognized standard of its class and is in the front rank of mechanisms devoted to clay working attests its good qualities as well as the spirit of improvement that governs the conduct of our business.

The service that a machine can be made to render the purchaser rather than its shop cost is never ignored, and to this fact, together with an appreciation of trade requirements gathered from constant study and experience, is due much of our success. The field affords ample opportunity for the exercise of ingenuity, and our inventions in dies, both steam and oil lubricated, different designs of augers, their finish, etc., has made it possible to work by our machines materials that would otherwise have been abandoned. Wherever our machines have been well introduced they will be found making a large proportion of the brick of that locality; and we regard this fact as among the most conclusive evidences of the value of our inventions, as well as the thoroughly first-class manner in which our machinery is designed and built.

The value of prompt attention to orders for supplies is appreciated, a large stock of standard parts being carried both in Philadelphia and Chicago to meet urgent requirements. Each casting is designated by a letter and number. A system of jigs used in manufacture insures interchangeable parts so far as practicable. Experienced brick manufacturers appreciate the value of this service. We do not guarantee the accuracy of boxed weights or measurements. Net weights of finished machines are subject to occasional variation.

Especial care is observed in boxing foreign shipments securely and in the preparation of shipping documents according to order.

The Question of Price

Do not give the purchase price, or first cost, of a piece of brickmaking machinery too much prominence in your consideration. The question of greater output, uninterrupted work, greater durability, continuous brickmaking service, are of far more importance.

Clay working machinery, in comparison with that used in many lines of manufacture, is particularly subject to hard use, and any reasonable expenditure in cost of building that will minimize wear or its effects is in the interest of the purchaser.

STANDARD SIZE BUILDING BRICKS

The dimensions adopted by the National Brick Manufacturers' Association for a standard hard-burned common building brick are 8¼ x 4 x 2¼ inches, and for a pressed front brick, 8⅜ x 4 x 2⅜ inches. The advertised capacity of our various machines is ample for these sizes of bricks.

The trade acceptance of "a brick" in one section of the United States involves about 75 cubic inches of raw material, while at another point the same designation imposes upon the manufacturer over 115 cubic inches. These facts should not be overlooked when comparing statements of machine outputs, costs of production, selling prices, etc.

TERMS OF SALE

Our machinery is conservatively rated and not infrequently exceeds advertised capacities. Machines that we regard as of stock patterns are often offered subject to final acceptance by customer after a trial period conducted at his own risk and expense and for his benefit. Others of special construction are not so offered. Our representations are made in good faith, based upon the information we may have at time of order, but since performance is so largely influenced by the material to be worked and by local conditions, we assume no contingent liability whatever should any machine fail to meet either our own or our customer's expectations.

Should any individual piece of a machine prove to be defective in material or workmanship to an extent affecting its usefulness, we will supply a duplicate part in exchange f. o. b. Philadelphia without charge, we reserving the option of requiring the defective part returned to our works, freight at our expense. Such parts are not to be returned without our order, and liability under this clause terminates at the expiration of one year from date of original shipment.

These terms do not apply to parts worn or broken as the result of continued use.

Patents

Our Brickmaking Machines, Automatic Cutters and some of our Clay Preparing Machinery are the subject of United States Patents.

Letters	Patent	No.	612,232,	granted	Oct.	11,	1898
"	"	"	612,247,	"	Oct.	11,	1898
"	"	"	612,249,	"	Oct.	11,	1898
"	"	"	656,879,	"	Aug.	28,	1900
"	"	"	656,880,	"	Aug.	28,	1900
"	"	"	656,896,	"	Aug.	28,	1900
"	"	"	663,688,	"	Dec.	11,	1900
"	"	"	663,689,	"	Dec.	11,	1900
"	"	"	678,259,	"	July	9,	1901
"	"	"	687,915,	"	Dec.	3,	1901
"	"	"	698,019,	"	April	22,	1902
"	"	"	709,097,	"	Sept.	16,	1902
"	"	"	721,152,	"	Feb.	24,	1903

Letters	Patent	No.	761,410,	granted	May	31,	1904
"	"	"	815,022,	"	Mar.	13,	1906
"	"	"	944,442,	"	Dec.	28,	1909
"	"	"	953,670,	"	Mar.	29,	1910
"	"	"	960,819,	"	June	7,	1910
"	"	"	1,007,391,	"	Oct.	31,	1911
"	"	"	1,012,990,	"	Dec.	26,	1911
"	"	"	1,014,376,	"	Jan.	9,	1912
"	"	"	1,031,747,	"	July	9,	1912
"	"	"	1,033,672,	"	July	23,	1912
"	"	"	1,041,805,	"	Oct.	22,	1912
"	"	"	1,077,226,	"	Oct.	28,	1913

Main Office at Works in Philadelphia

Drawing Room and Fire Proof Vault for Storage of Drawings and Brick Works Plans

Our customers have here available a most valuable record in event of fire loss.

Auger Brick Machines

When the Chambers standard pattern of Auger Brick Machine was first marketed it was impossible to get brickmakers to entertain the use of any clay preparing machinery.

A brick machine that would not receive the clay direct from the bank and make it immediately into bricks received scant consideration. Stones, horseshoes and other foreign matter were incidents of the day's experience. The conditions thus imposed upon the machine builder resulted in the provision of liberal clearance spaces; an arrangement of knives permitting of a back flow of clay under certain abnormal conditions; clean-out cover plates and various safety appliances that combined to make a machine establishing a world's record for continuous operation and for single machine production. One Chambers Brick Making Machine operated in the Chicago District holds the record of 354,000 building brick in eight hours, while another has a week's average of 44,900 bricks per hour. These are exceptional outputs, made under very favorable conditions. The same size machine operated under conditions prevailing in many localities does well to produce 100,000 bricks daily.

One of the first Chambers machines, built in the early sixties, is still in practical operation.

For Large Refractories "THE ROYAL" For Street Pavers

As this catalogue is sent to press we are making the patterns for an improved Auger Machine along the lines of our "Standard Pattern," but heavier and stronger than any previously made.

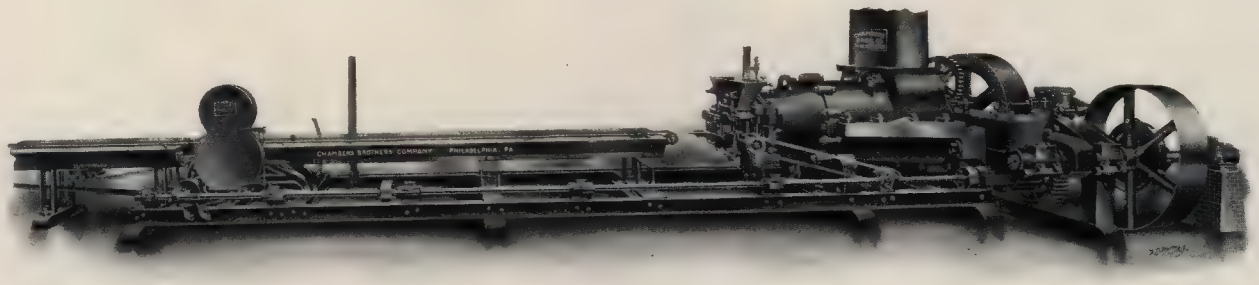
Retaining the valuable features of the "Standard," the new "Royal" will have a rugged strength not yet reached even in our Chicago Special, and is designed with special reference to the requirements of the paving block and heavy fire brick trades.

The Chambers Standard Pattern Auger Machine

Even with the present-day use of crushers, pug-mills, etc., the "CHAMBERS STANDARD MACHINE" in its four sizes is still the best for use under many conditions and for certain materials. Its sharp edge, hardened steel knives, by cutting through the mass of clay as it is fed forward, aid in its temper in a manner not accomplished by other designs.

These individual tempering knives are adjustable in pitch to compensate for wear and to meet the facility with which different clays can be made to flow through the die. They are readily replaced when worn out.

The Standard Pattern is much the most flexible machine in its adaptation to different brickmaking conditions. It stands an enormous amount of abuse and still makes brick.



The Standard Pattern Chambers End-cut Brick Machine

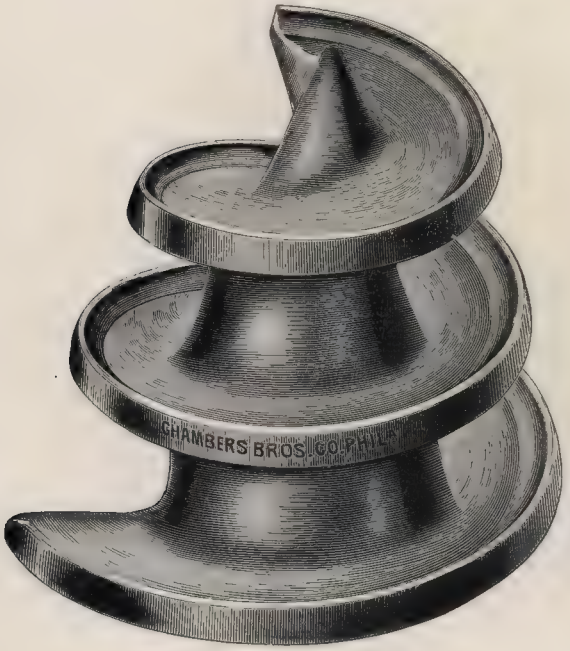
Capacities, 20,000 to over 100,000 bricks daily.

The best machine for rough or insufficiently prepared materials. Sometimes used for briquetting purposes.

Expressing Screws

This particular part of our machine has been the subject of much study and costly experiment. Not only its shape, but the material from which it is made, as well as the manner of finishing, are of prime importance.

For all sizes of our Auger Brick Machines we have numerous patterns of Expressing Screws. Some single thread, double thread, or single thread with double bitted discharge. Some of fine and others of coarser pitch, with different degrees of taper. This multiplicity of patterns has grown out of the needs of different customers because of the great variation in materials worked as well as the character of product required.

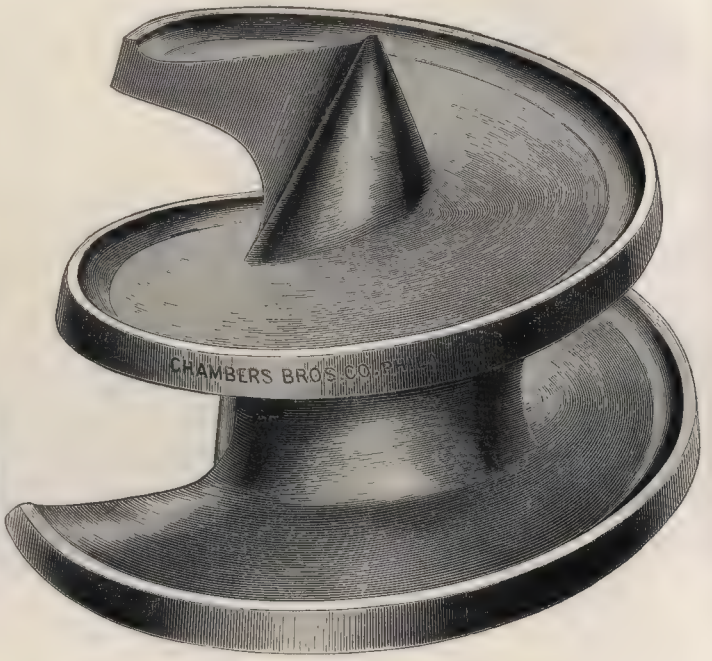


Style No. 26

Used for sandy or very loamy clays that do not slip easily.

Style No. 349

An easier working screw for plastic clays that slide forward more easily. A shorter screw, having less turns of the thread and productive of less "auger lamination."

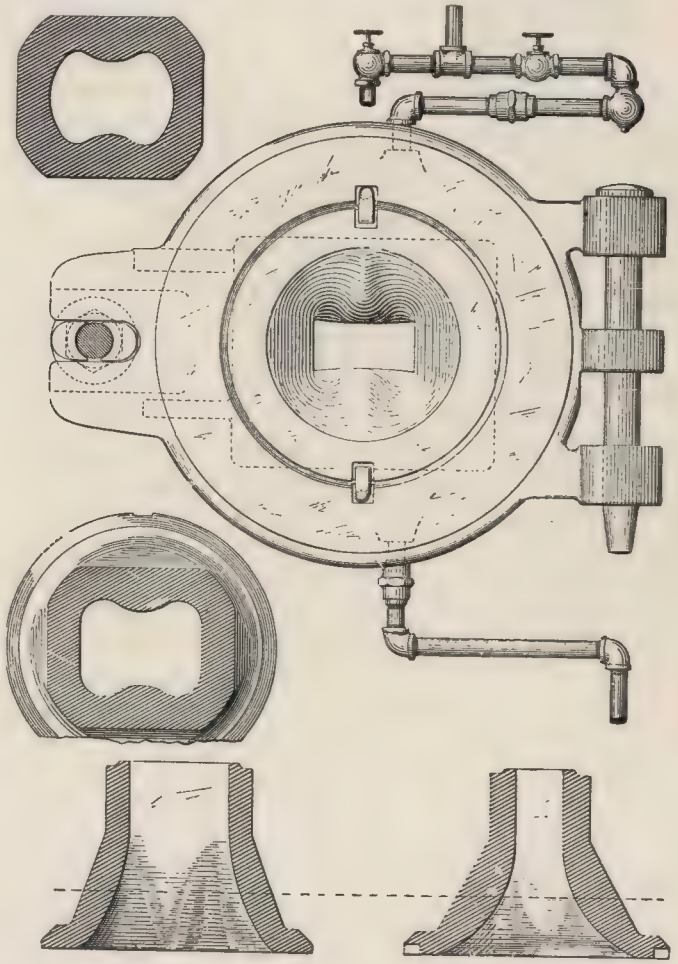


Style No. 428

Made expressly for smooth, free-flowing clays. A pattern of large capacity in suitable material. A screw that would be unsafe, in fact useless, in materials for which style No. 26 was designed.

Brick Machine Dies

We have given a great deal of attention to the subject of Brick Machine Dies and have made literally hundreds of different patterns for shapes and sizes. Some are one-piece dies, others with renewable liners, some non-lubricating, others steam heated, and still others for water or for oil lubrication under pressure. A change in shape or length frequently makes a marked difference in product. The location of die relative to the end of the auger affects the power required for operating machine as well as influences the structural formation of the clay bar. The extent to which these influences are manifested depends largely upon the characteristics of the material to be worked.



Oil Lubricating Die for End-cut Brick

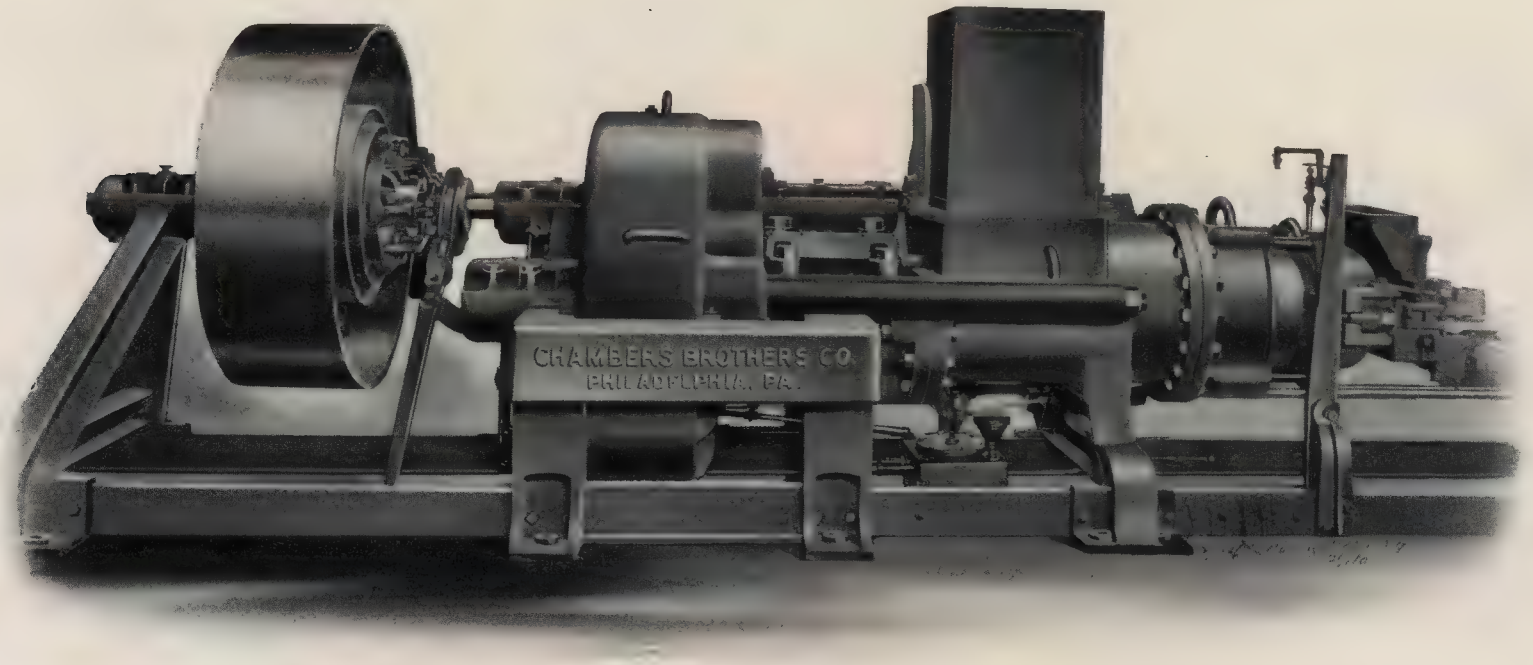
(Patented)

Consisting of Die proper, Curved Steel Valve Ring, Gasket and Clamping Ring.

For detailed construction see page 34.

For Pressure Pump used in connection with the End-cut Lubricating Die see page 20.

The Keystone Pattern Auger Brick Machine



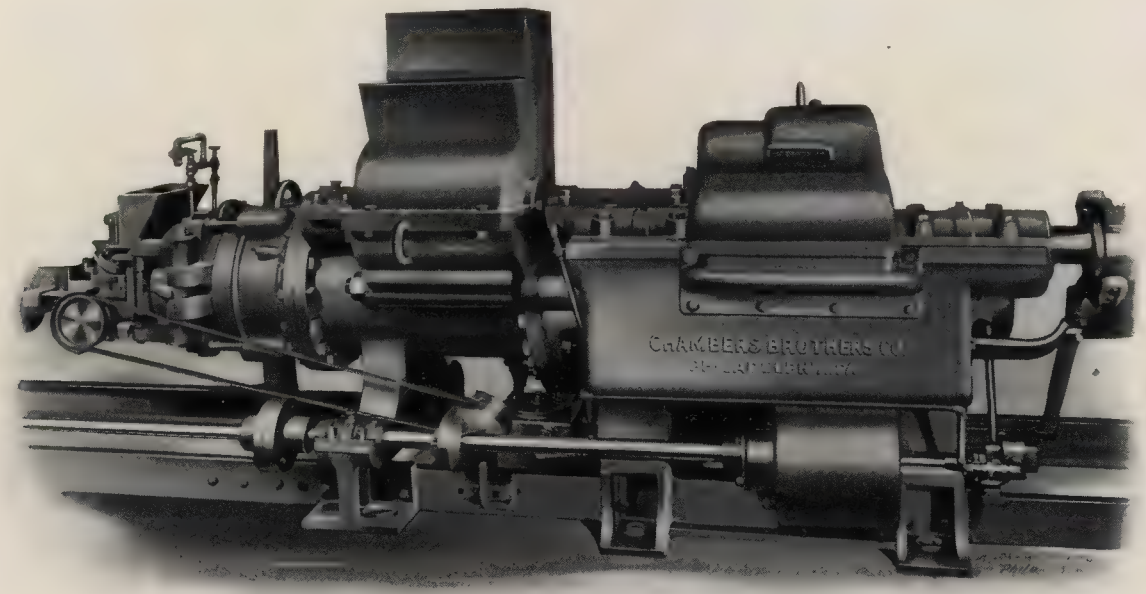
Near Side View of Keystone No. 1

The clutch pulley is 60 inches diameter by 18 inches face.

This machine is not intended for working rough materials, but has been designed expressly for shales and hard clays that have been ground and screened, or subjected to the customary dry-pan preparation. The Keystone Auger is primarily a molding and expressing machine of great strength, with its power transmission end embodying features not found in other auger brick machines. It should be installed only in connection with an independent pug-mill of ample capacity.

The Keystone has a straight barrel. The adjustable tempering knives of our Standard Pattern being replaced by a continuous spiral of decreasing pitch and of a diameter closely fitting the bore of machine case, or with cast blades of manganese steel and of non-adjustable pitch.

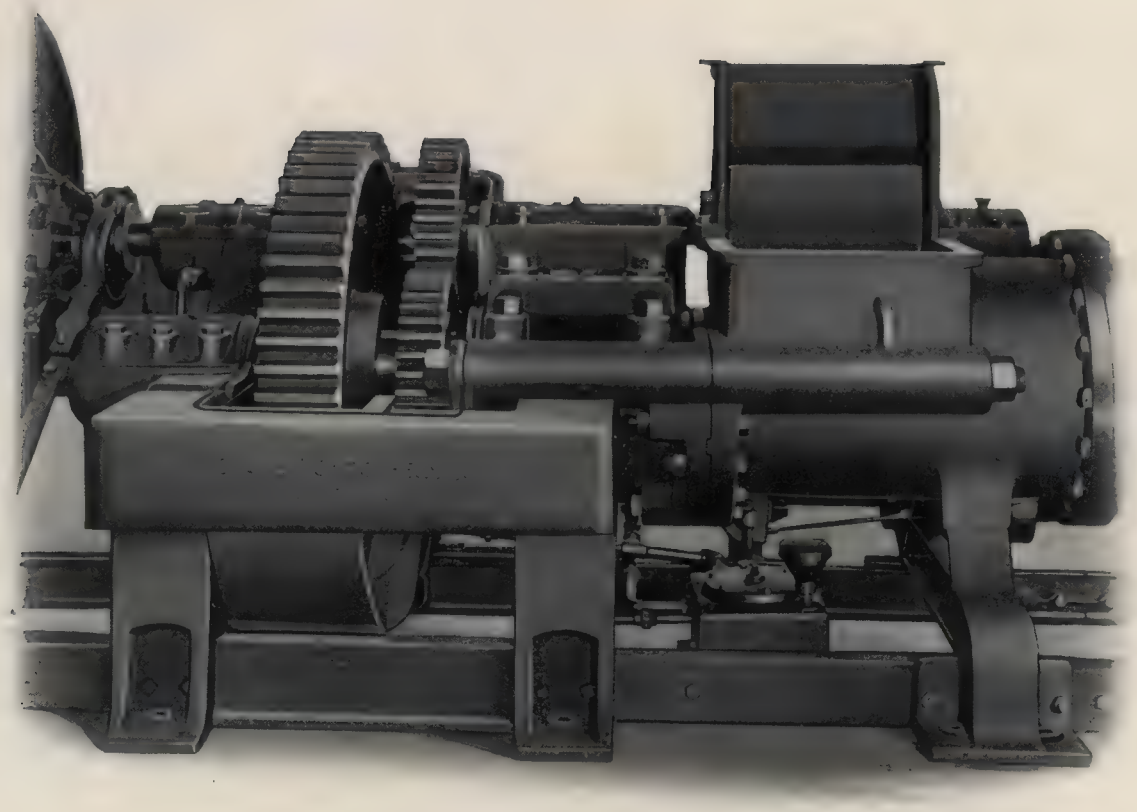
The hopper is of new design and fitted with a positive feed mechanism that forces the clay down into the machine case so that the spirals or blades compressing and feeding clay to the auger are properly supplied.



The Far Side of the Keystone Auger Machine

With clutch pulley omitted.

Observe the protection of all gearing.



The Keystone Brick Machine No. 1

With gear cover removed. Oil reservoir and pipe connections shown in base. The highest standard for Auger Brick Machinery.

Auger Shaft.—Is of steel and is covered throughout its whole length. No portion is subjected to the abrasive action of the material.

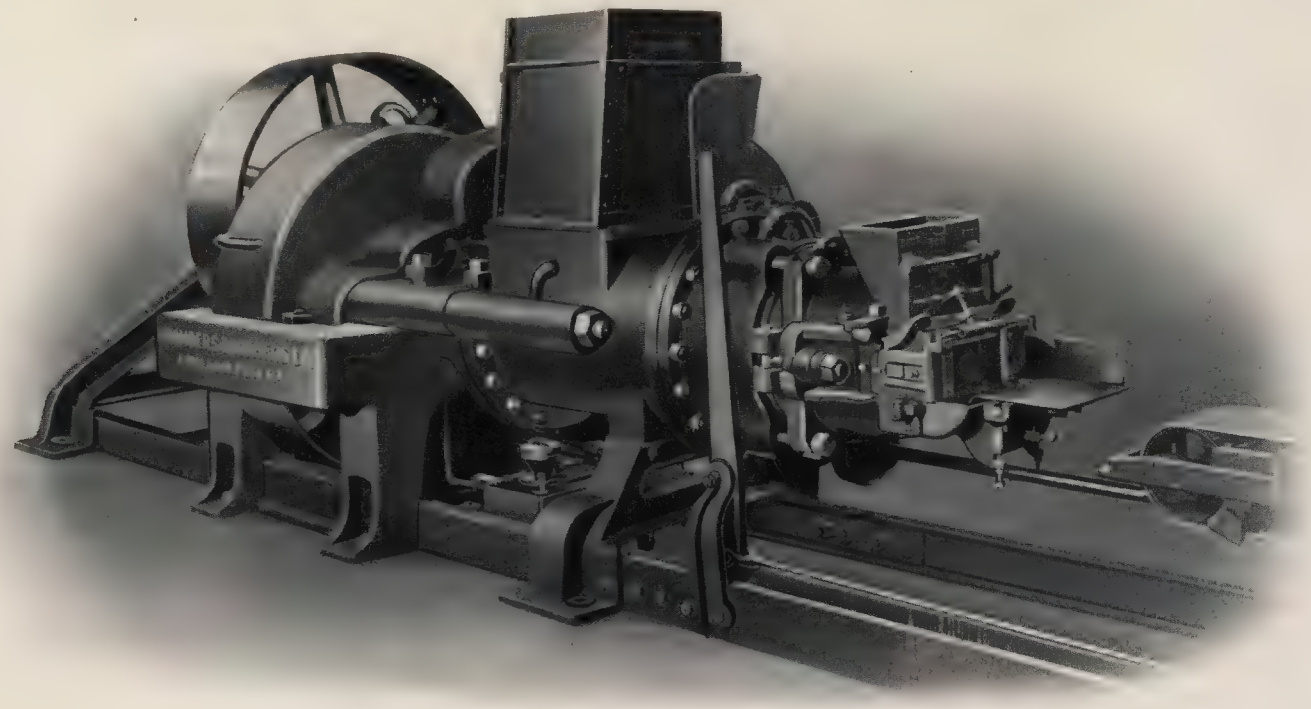
The End Thrust.—Its details embrace too long a story for this space. Suffice that it is so ample, so well provided and so well and positively lubricated by a constant flow of oil under pressure that the "man who owns one" may forget the subject of end thrusts.

THE DRIVING GEAR.—Cut teeth exclusively, of strong pitch and ample face and immersed in an oil bath. At the first revolution of the machine every gear tooth is constantly lubricated. Running so quietly as to be almost noiseless, it has one less driving shaft, two less journals and two less gears than most Auger Brick Machines.

DIE.—Has a Die designed for oil, water or steam lubrication, with provision for constant feed against the pressure of clay.

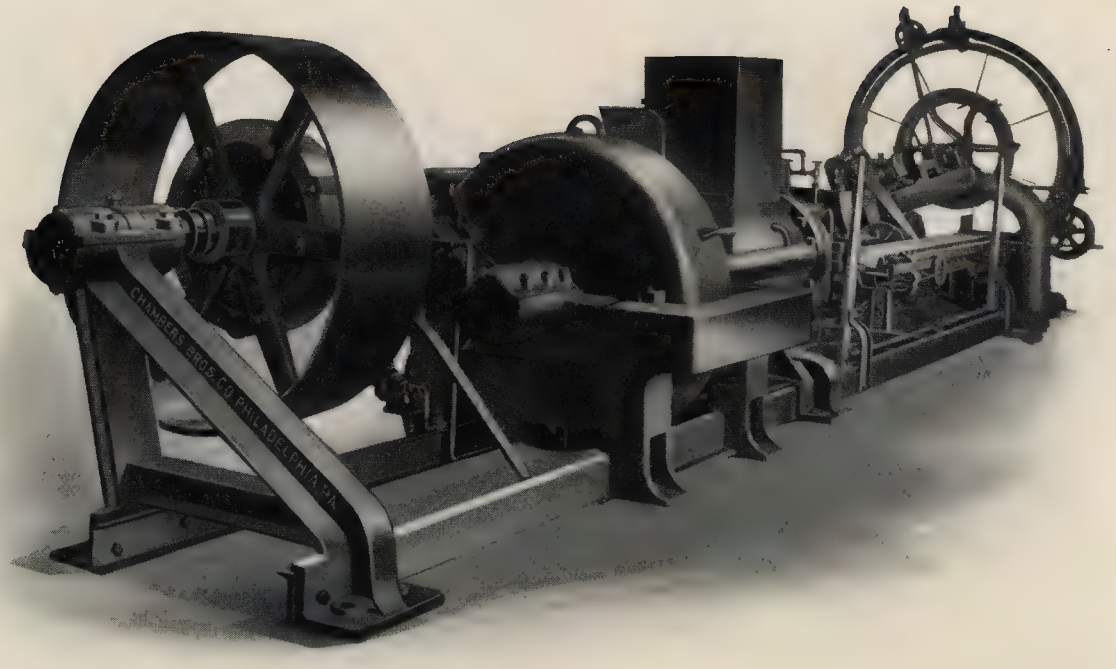
DIE HOLDER.—Is attached on the telescopic plan, enabling each operator to place the die at that distance productive of best results with his particular material. The machine builder may sometimes make a good guess at this relative location of Die and Auger for a clay bank a thousand miles away, but the best possible achievement is within the grasp of the intelligent operator on the job, when provided with the flexibility of this machine.

JOURNAL BEARINGS.—Long, large, packed at the ends to keep out the dirt and keep in the oil. Then lubricated by a circulating system through ¾-inch wrought pipe connected with a dirt-tight reservoir supplied by a mechanical pump which automatically starts operation as soon as the machine is started.



The Keystone Brick Machine No. 1

With Side-cut Die and Automatic Sander.



Keystone No. 1 Brick Machine and the No. 5 Rotary Cutter

One brick at a time, but eight bricks at each revolution of cutting reel. CUTS BOTH BRICK AND BLOCK FROM THE SAME CLAY BAR.

Dimension Data

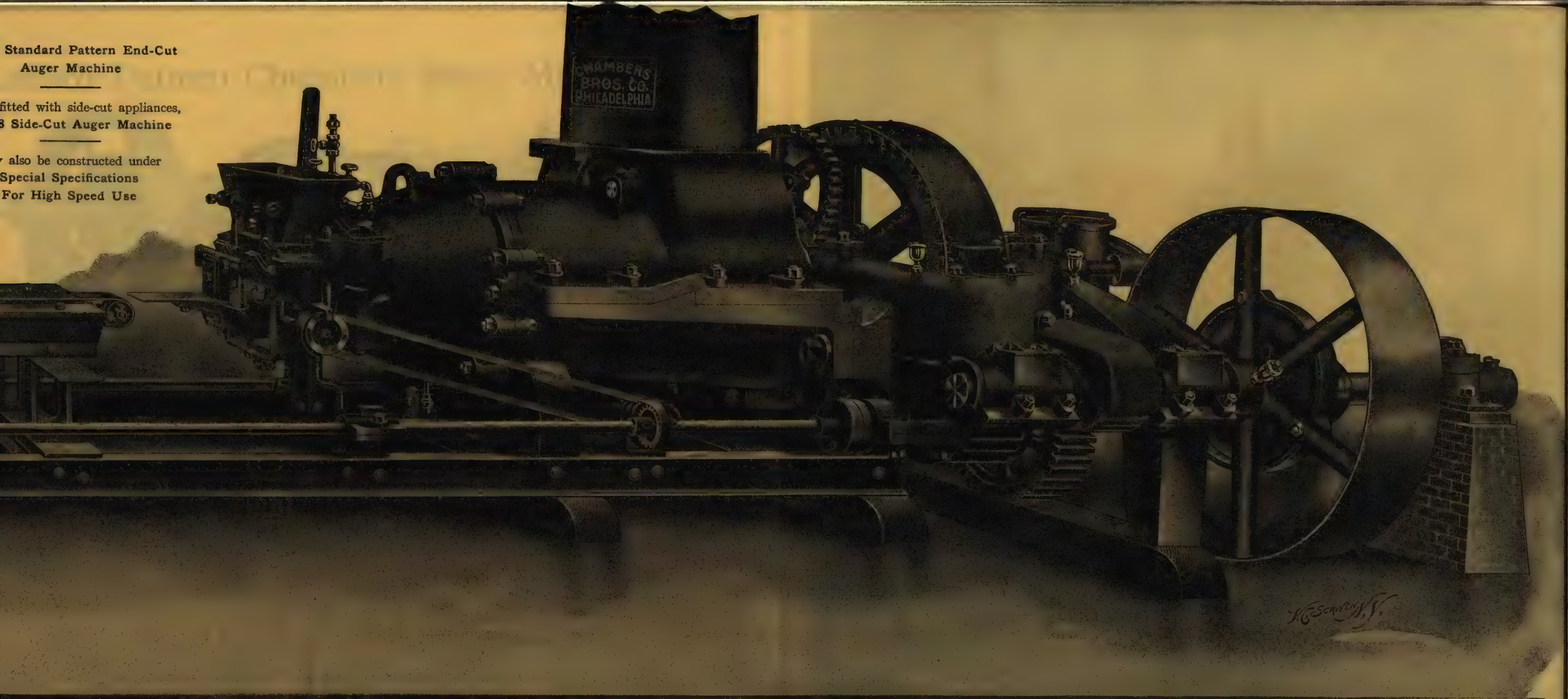
Weight of machine and No. 5 Cutter unboxed is about 32,000 pounds. Length from outer edge clutch pulley to end of 16-foot delivery frame is 48 feet.

Greatest width of floor space, about 8 feet.
Height from floor line to top of cutter reel, 8 feet, 10 inches.
Friction clutch pulley is 60 inches diameter by 18 inches face.

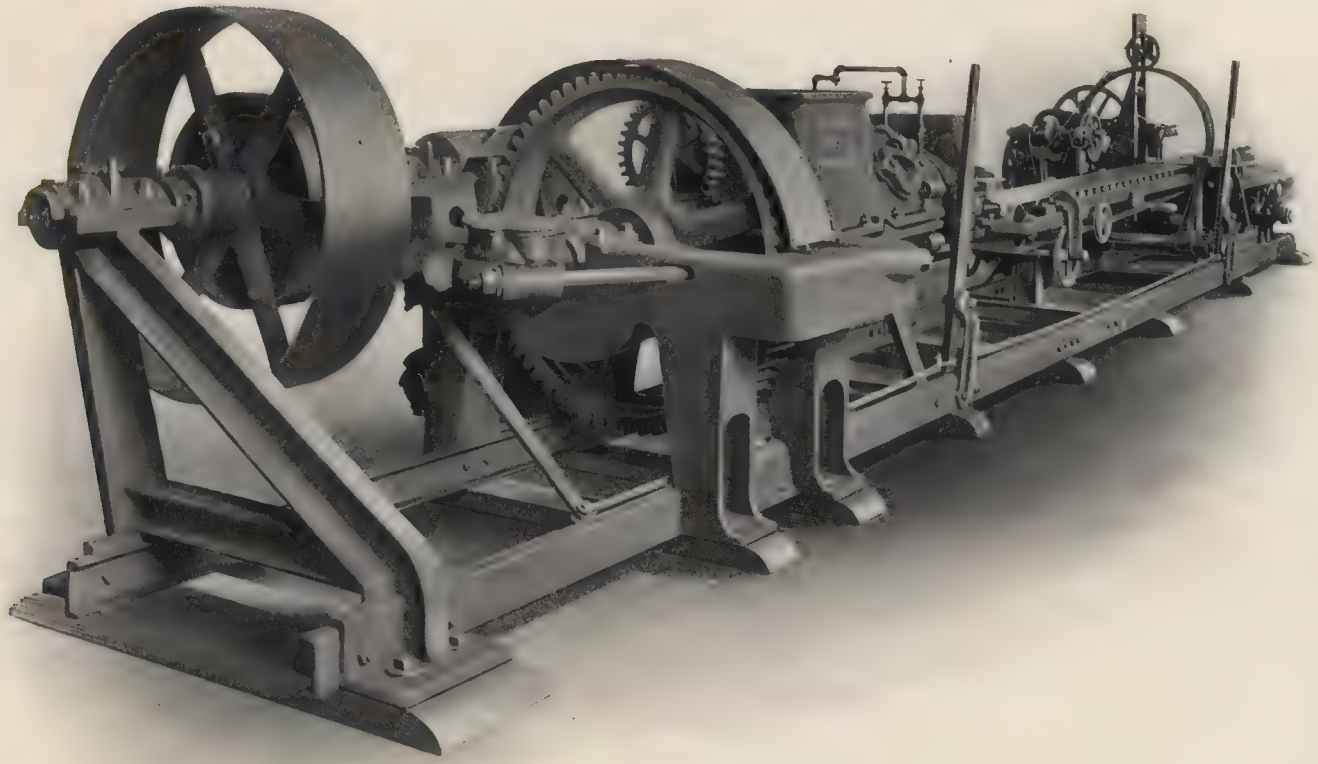
Standard Pattern End-Cut
Auger Machine

fitted with side-cut appliances,
3 Side-Cut Auger Machine

y also be constructed under
Special Specifications
For High Speed Use



Standard Pattern Chambers Brick Machines



The No. 10 Auger Brick Machine with No. 6 Automatic Side Cutter

Capacity, about 40,000 standard size building bricks daily.

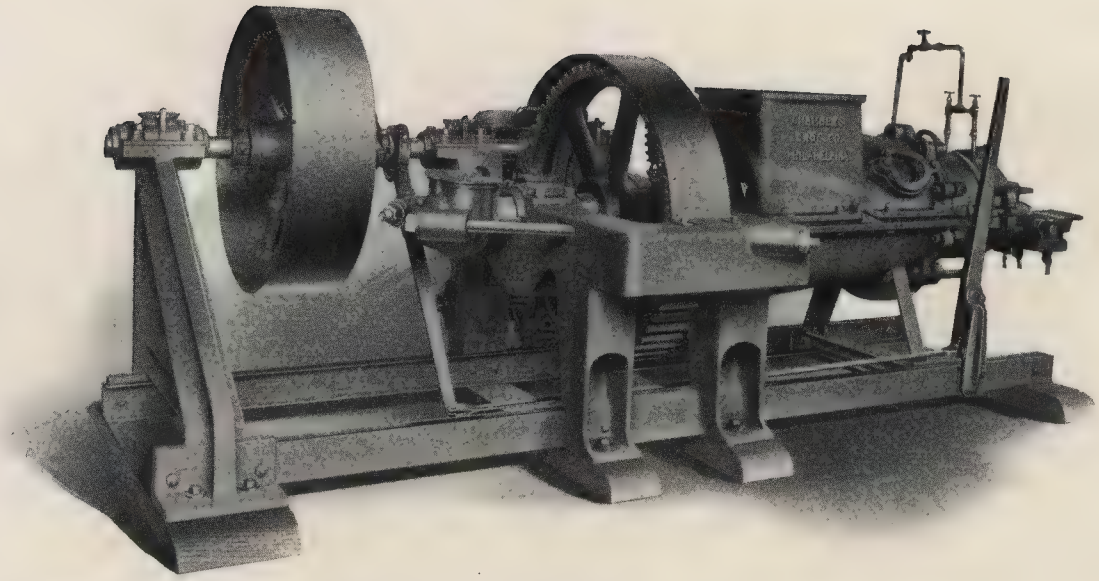
Weight of complete machine, including cutter, about 14,200 pounds unboxed.

Length from outer edge of clutch pulley to end of 16-foot delivery frame is about 49 feet.

Greatest width of floor space is about 6 feet.

Height from floor line to top of clutch pulley is about 5 feet.

Friction clutch pulley is 44 inches diameter by 12 inches face.



The No. 10 Standard Pattern Auger Brick Machine for End-cut and Side-cut Brick

Best design for moderate capacities. Recommended for an output of 3,000 to 5,000 standard size building brick per hour. The No. 20 Auger Brick Machine of same design has capacity of 2,000 bricks per hour.

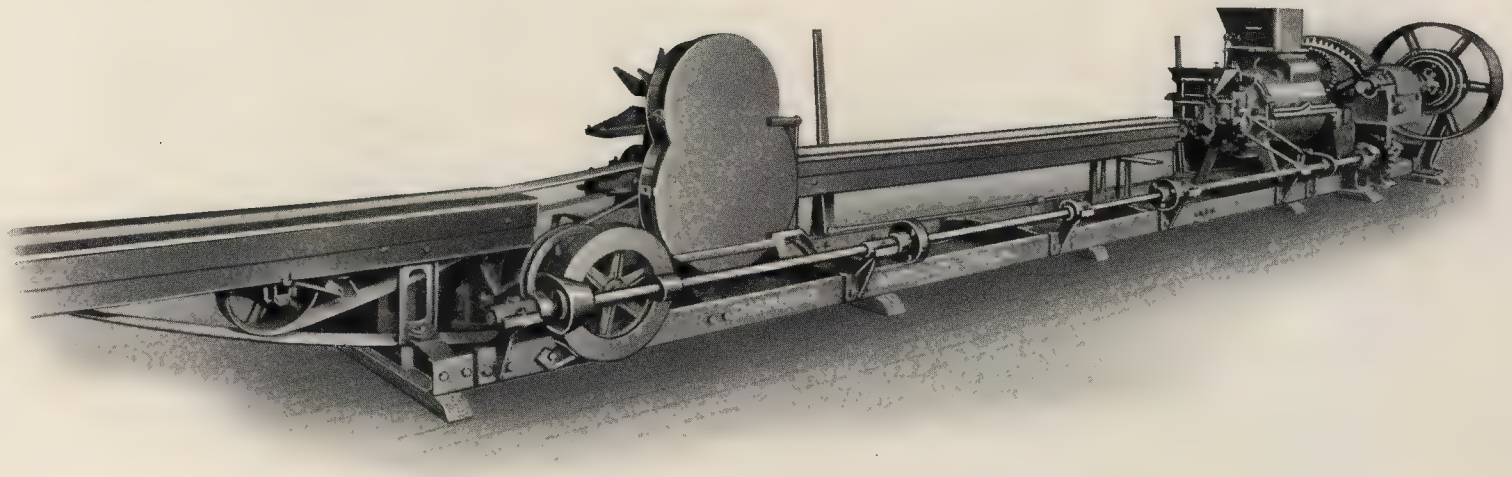
Dimension Data

No. 10 AUGER MACHINE

Capacity, 3,000 to 5,000 standard size building brick per hour.
Clutch pulley, 44 x 12 inches.
Weight of machine, exclusive of cutter, about 10,000 pounds.
Driving shaft, $3\frac{7}{16}$ inches diameter.
Greatest diameter of tempering shaft, 9 inches.
Length from outer edge of clutch pulley to end of die is about 11 feet 6 inches.

No. 20 AUGER MACHINE

Capacity, 1,000 to 2,500 standard size building bricks per hour.
Clutch pulley, 36 x 9 inches.
Weight of machine, exclusive of cutter, about 8,000 pounds.
Driving shaft, $2\frac{15}{16}$ inches diameter.
Greatest diameter of tempering shaft, 7 inches.
Length from outer edge of clutch pulley to end of die is about 10 feet 6 inches.

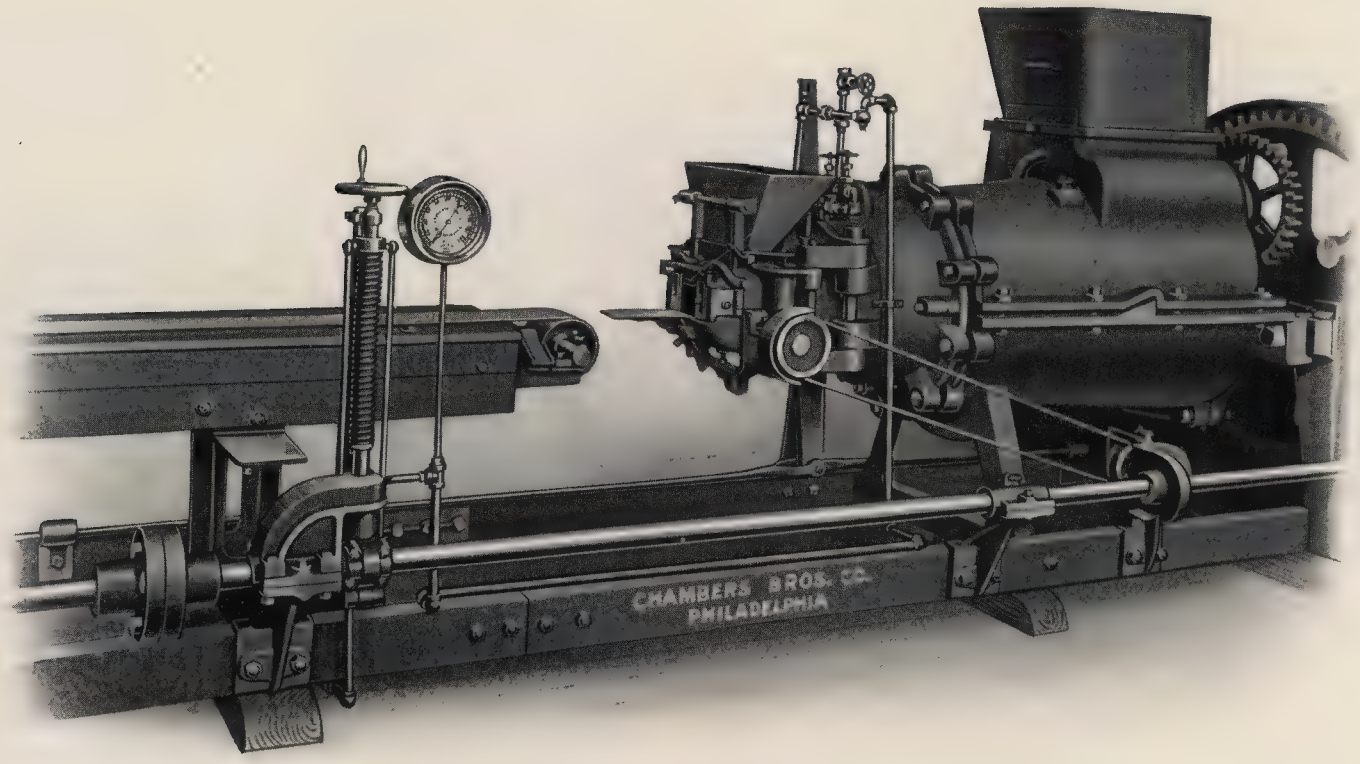


The Nos. 10 and 20 Standard Pattern Single Gear Brick Machines

With No. 8 Automatic End-cutter

Produces sand faced or oil faced end cut building brick moulded stiff enough for piling seven high on edge directly from the machine.

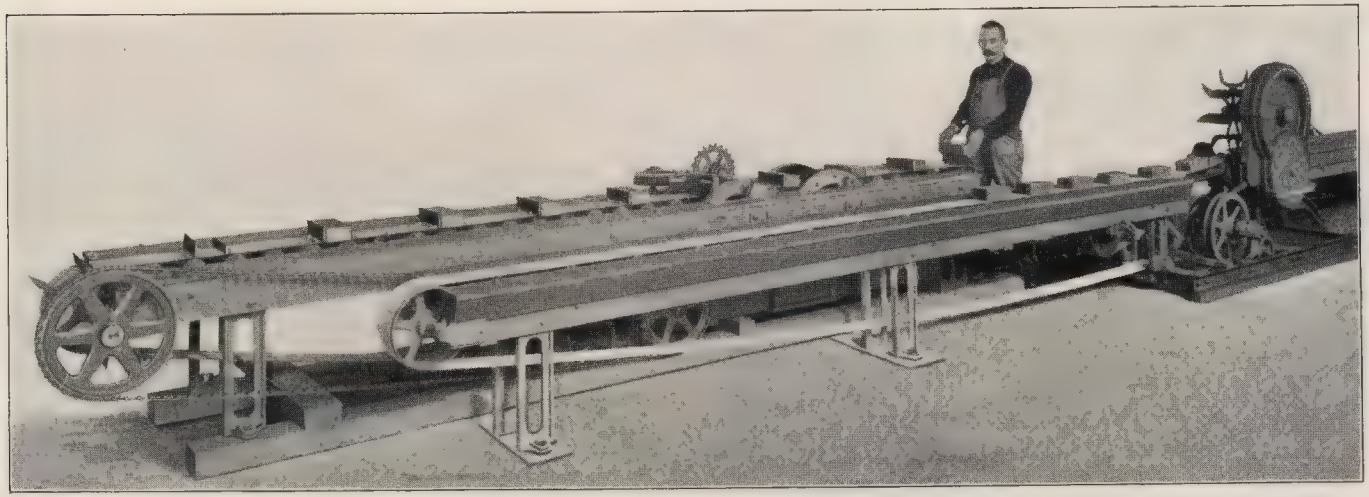
With the minimum amount of labor, brick that bear transportation and rehandling with the least breakage.



Illustrating Pressure Pump with Gauge and Connections for Lubricating the Die with Oil

The supply of oil may be located in any convenient position for gravity feed to the pump. A cam upon the brick machine line shaft operates the pump plunger. The apparatus may be adjusted for any required pressure up to 125 pounds per square inch, the quantity of oil used being regulated through a needle valve. The pressure necessary for securing die lubrication on a side-cut machine being so much less than on the end-cut—say 60 pounds as against 90 to 100 pounds per square inch—side-cut outfits generally include a pressure tank for direct connection to the steam boiler instead of the pump for forcing the oil into the die.

The oil is applied in the back portion of the die, just as the mass of clay is being reduced to a rectangular form. It not only aids in securing a smooth clay bar, but relieves the brick machine of strain and saves some power. This system is not used on all of our machines, as the oil lubricating dies are more expensive than those of our Standard Pattern and the quantity of oil used is a factor to be considered. However, many clays are worked by this apparatus that could not be manufactured through other styles of dies.



The Chambers Head Sander and Brusher in Position with End-cut Brick Machine

(Patented Oct. 11, 1898.)

The operator takes a position at the end of the Head Sander and close to the automatic cut-off, where he has an opportunity to select the bricks, and only transfers to the continually moving belt of the Head Sander bricks that are free from stone or other disfigurement.

The angle-iron supporting pieces correspond in length with the bricks, and are secured to the belt. They thus form a guide and a rigid support for the brick while it is being carried by the belt between two pairs of revolving circular brushes. Dry sand in the box is kept constantly against the faces of these brushes, so that, as they revolve against the motion of the brick, they brush the sand into both heads of the brick. The action of the brushes at the same time smooths the heads. The result is a stiff-tempered end-cut brick with sanded faces and sanded heads, which burn the same color as the face. Sufficient room is given for off-bearing the bricks, and a little care in selecting and handling the bricks enables our customers to produce a very profitable grade of stretcher brick. The capacity of the Head-Sanding Machine is about twenty-five bricks per minute. It may be used to sand bricks that are intended for repressing.

Length about 16 feet.

Width of floor space occupied is about 3 feet.

Unboxed weight is about 2,500 pounds.

Automatic End Cutters for Brickmaking Machines

In the development of our Brickmaking Machines we have invented several patterns of automatic cutters—the single knife, spiral blade, revolving disc, endless belt wire cutter and numerous reel wire cutters. None so simple and efficient for all materials as our No. 8.

Front View of No. 8 Automatic Brick-Cutter

Built to cut single stream on flat face, single stream on edge or double stream on edge.

It is self-regulating, its speed being controlled by the moving clay-bar, which may be ten bricks per minute or five hundred bricks per minute.

It consists of a regulating frame or table, on to which the clay-bar is carried and by means of which the speed of the cutter is controlled.

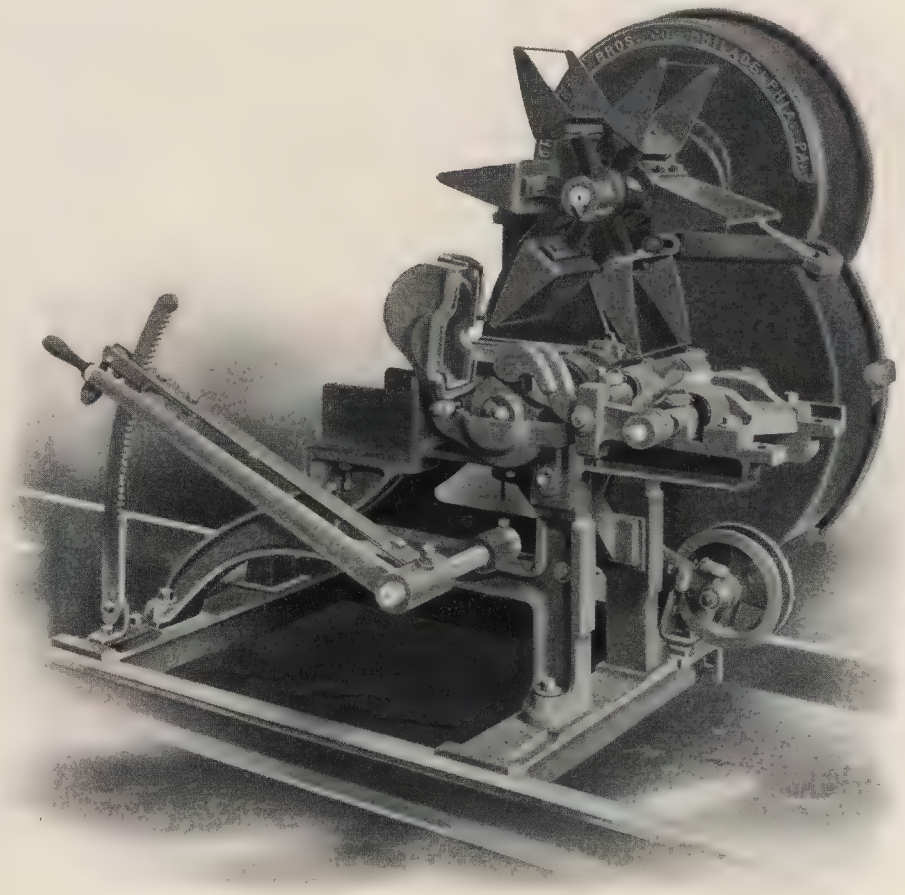
The cut-off wires are strained on steel bows or springs to the proper tension to cut, and yield readily to obstructions.

The wires are carried by their springs on a sprocket-wheel over and through the clay-bar, and are guided by a cam encased in a dirt-tight case.

The partly severed brick is supported and held against the clay-bar until operation is completed, when it is dropped on to the off-bearing belt and promptly carried off, thus permitting the return of the wire above the clay-bar again between the brick and the end of the bar. Bricks of uniform lengths with square heads cut with such smoothness as a fine steel wire will give are thus secured.

The wires cut around stones or spring over them. Should a wire break, it can be renewed at once.

The length of the bricks can be changed at a small cost for duplicate parts.



(Patented May 31, 1904, and March 13, 1906)

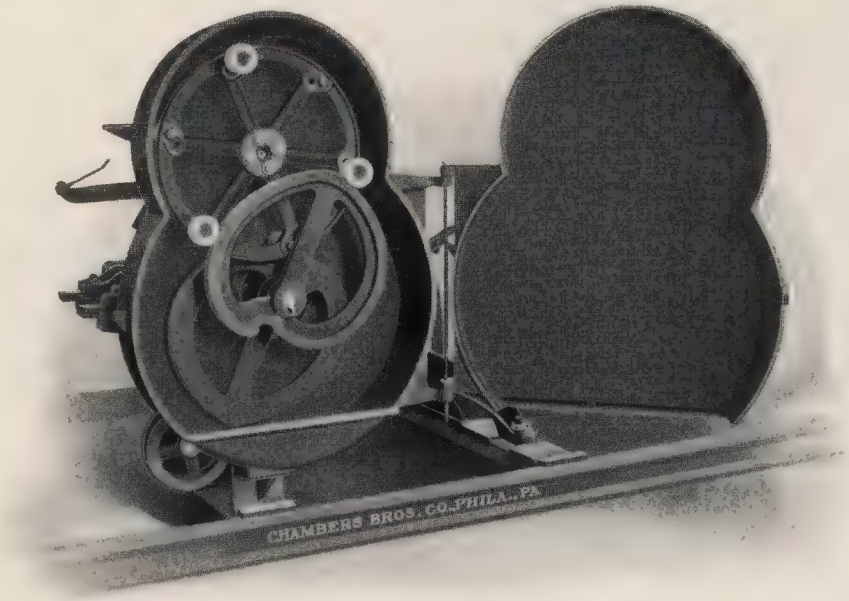
In comparison with some of our earlier patterns of reel wire cutters the No. 8 is a very marked improvement. One essential difference is that the cam roller wheel has three lugs on each side, and these consist of steel pins, carrying steel rollers. These rollers are bushed with a self-lubricating bushing. They roll against the face of the cam, instead of sliding, and this rolling contact minimizes wear between the tappet and the cam. There being no sliding contact, it is not necessary to lubricate the face of the cam, or the rollers, consequently there is no oil or grease in the bottom of the cam case, and the trouble arising from getting the friction belt greased is obviated.

The cam is double, on which two rollers are in contact at all times, thus taking up all back lash. This makes it impossible for the wire to be pushed out of position by any hard substance in the clay bar; or, in other words, the wire must always travel in the path determined by the shape of the cam. The only deflection will be a deflection through the elasticity of the wire itself, and even a large stone against the wire cannot push the roller away from the face of the cam. Where the clay is well prepared, the brick will be cut squarely, and this condition will be maintained with small expense for renewals.

In this cutter the cam itself drives the wire reel, and any little obstruction in the clay under the wire simply makes the roller bear that much harder on the cam.

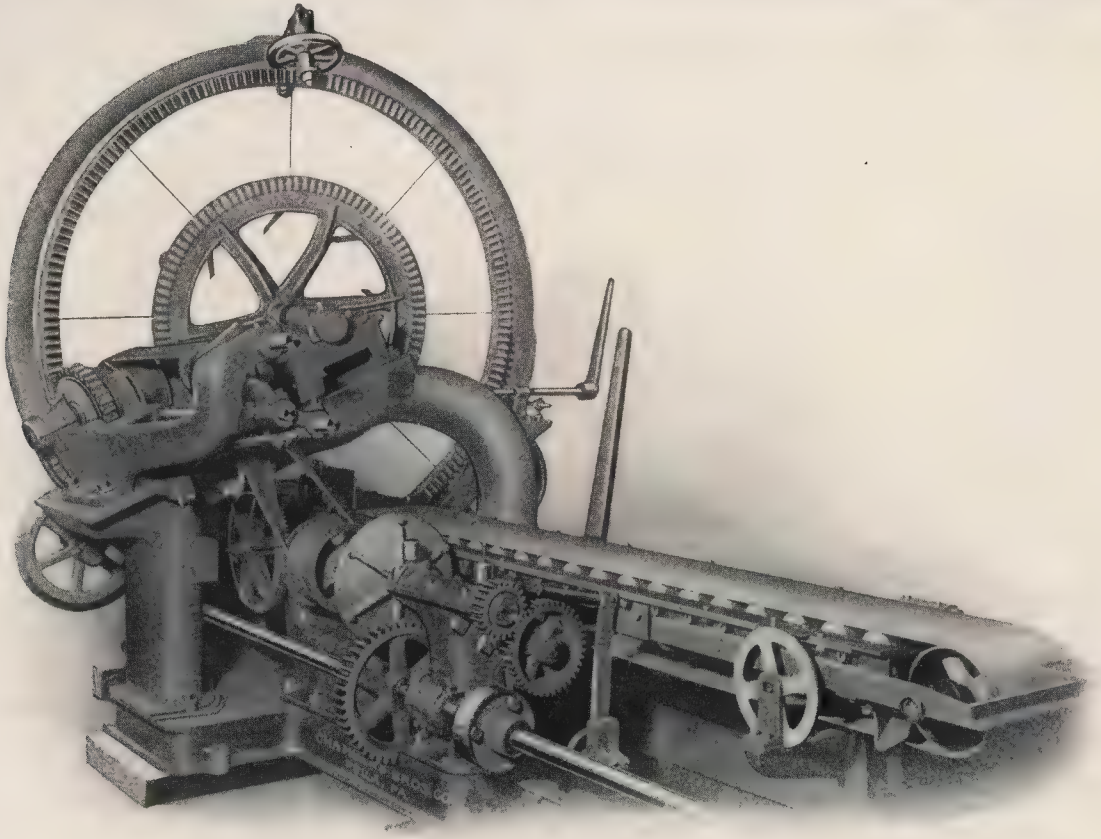
The friction belt is applied to a flanged wheel on the shaft of the measuring wheel itself, thus insuring easy regulation.

The cutter is provided with a wire cleaner and built under a system of jigs producing interchangeable parts, the cams being shaped by a generating machine, designed and built especially for this work. Changes in lengths of bricks cut can be effected with assurance of accurate results.



Rear View No. 8 Brick Cutter, Showing Open Cam Case.

Automatic Side Cutters for Brickmaking Machines



The No. 5 Rotary Side Cutter, Showing Side Nearest the Die. Used in connection with our Keystone No. 1, Standard Pattern No. 8 and No. 10 Machines.

In the completed machine the spur gears are encased. Distance from face of die to cutting wire is 12 feet 6 inches. Height from ground line to top of cutter 8 feet 10 inches, width at widest point 7 feet 3 inches. Weight, including one 16-foot length of delivery frame, about 9,000 pounds.

The driving shaft of this cutter should make 82 R. P. M. for 10,000 bricks per hour; or 89 R. P. M. for an output of 12,000 per hour. If the cutter shaft is to be driven by other means than connection with a Chambers Brick Machine, a pulley 20 inches diameter by 6 inches face may be used.

The No. 5 Rotary Side Cutter

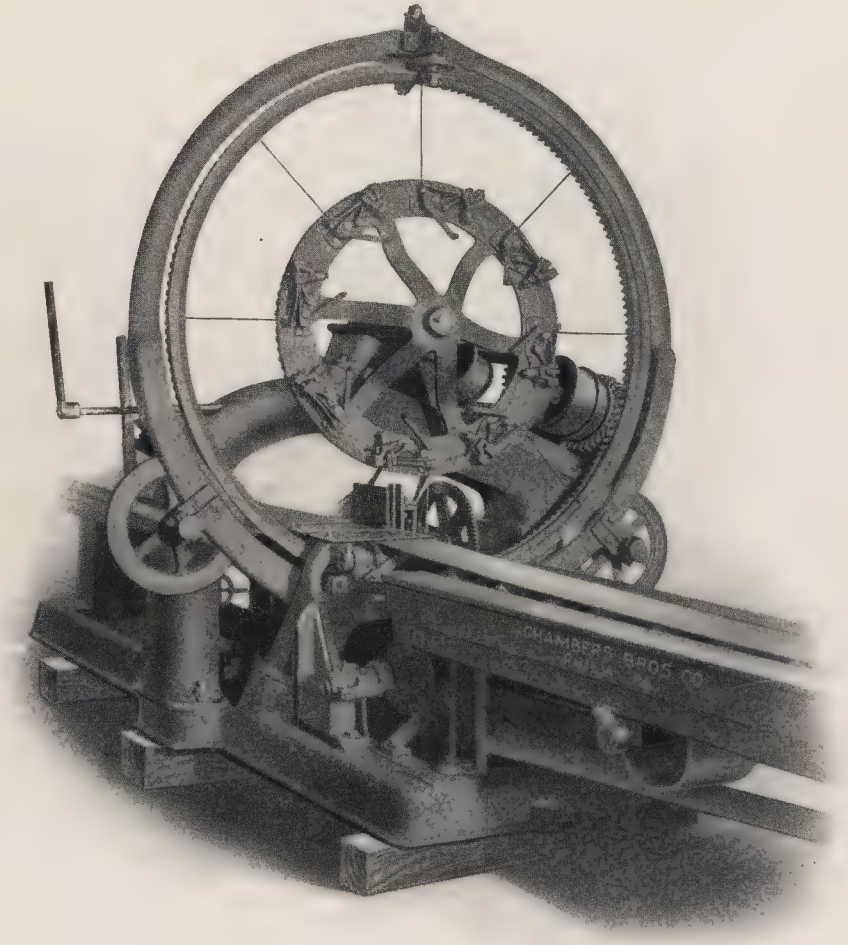
This is an 8-wire cutter in which the rings carrying the wires are driven by rawhide pinions engaging in cast-iron gears. The wire is relieved of all strain save that of passing through the clay. The frictional regulation of cutter speed is obtained by an encased cone friction instead of the slipping belt, and is so accurate that a very slight pressure from the clay bar is quite sufficient. We thus avoid any possible swelling of the clay bar as well as any slippage of belt with the attendant variation in thickness of bricks.

Provision is made for stones or foreign substances in the clay. The vertical slit plates through which the wire passes upon completing its cut are supported by springs which yield for the discharge of stones or other hard substances. The cutter can be instantly stopped by means of a brake without stopping the brick machine itself. It is a most satisfactory high-speed cutter, cutting one brick at a time only. It will cut a section as large as 6 x 12 inches or 7½ x 7½ inches with a large range in thickness. Changes in thickness are readily accomplished without serious expense.

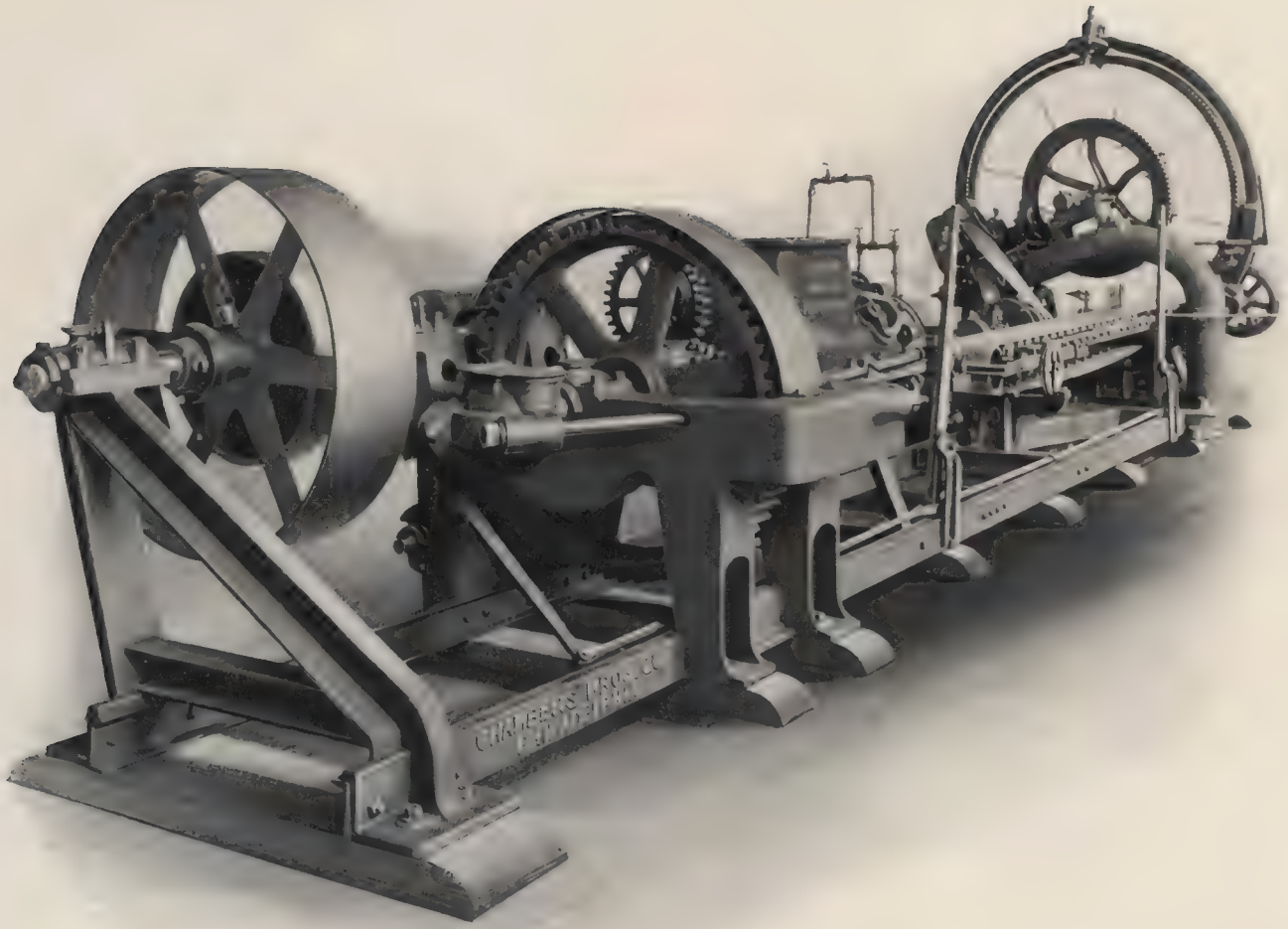
The No. 5 Special Cutter

For Furnace Block Work

Is a special construction larger and heavier than the Standard No. 5 Cutter. It can be built to cut block having a cross section of 6 x 12 inches, 8½ x 17 inches and 9¾ x 9¾ inches. It is a more expensive cutter than the Standard No. 5 and not so desirable for building brick sizes.



The No. 5 Rotary Side Cutter, Showing Brick Delivery Side

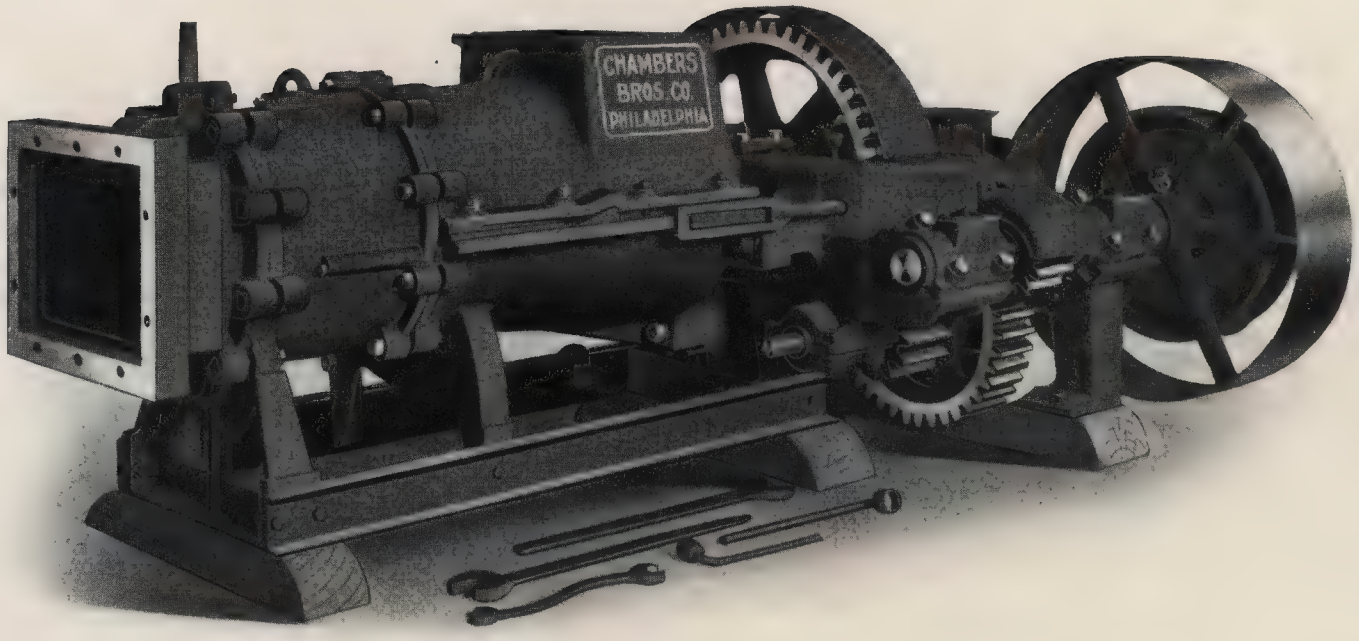


Standard Pattern No. 10 Brickmaking Machine with No. 5 Rotary Side Cutter in Position

The No. 5 Cutter is not recommended for speeds of less than 4,000 bricks per hour.

Typical arrangement of buildings and outfit for a brick plant working a surface-dug plastic clay and employing either a No. 10 or No. 20 size End-cut Brick Machine. The outfit includes clay disintegrator, clay elevator, pug-mill and brick machine.

The building provides ample room for handling the product and is well lighted and ventilated. Room also for one or more Represses. Main line shaft mounted upon brick piers of sufficient height for head room places belts out of the way and secures good, rigid support for shaft. Erection plan No. 88-B-38.



Fire-Proofing Special for Large Sections

Dimension drawing No. 66-D-83. The opening in die holder is 17 x 24½ inches.

The friction clutch driving pulley is 48 inches in diameter by 14½ inches face with our extra heavy No. 10 clutch.

Driving shaft $4\frac{7}{16}$ inches diameter. Counter shaft $5\frac{5}{16}$ inches diameter.

The main auger shaft through the machine is a hammered steel forging.

We fit this machine with cut steel gears, or with molded gears, as customer prefers.

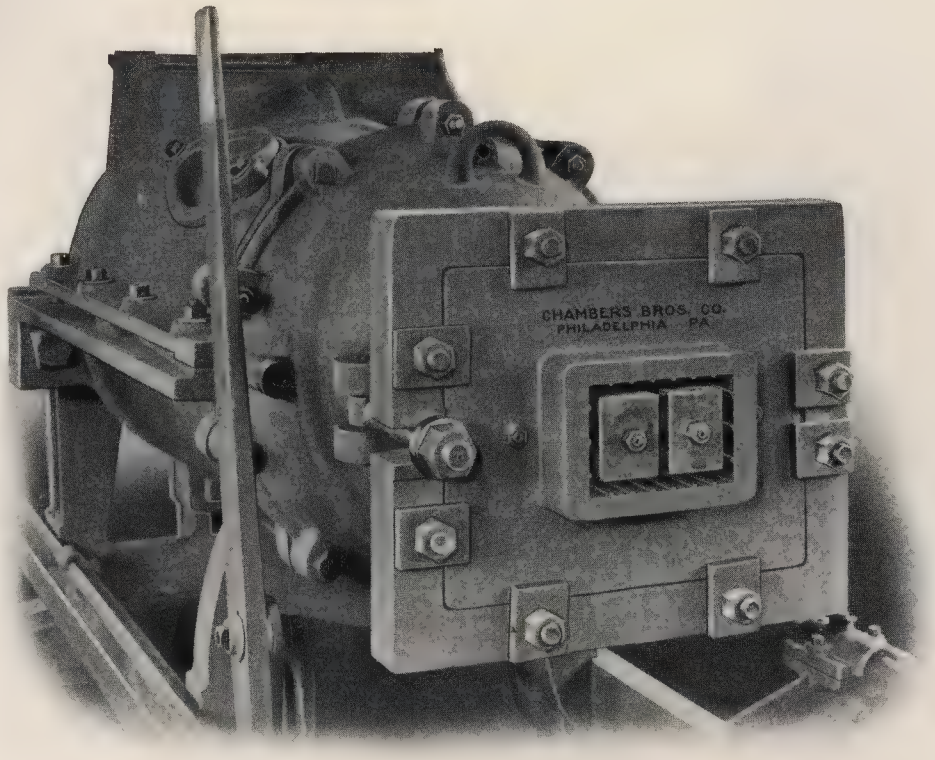
The opening for the admission of clay to the case is 19 x 25 inches.

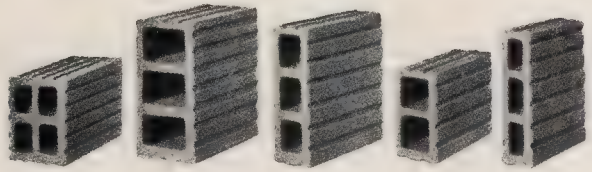
The propellers are made of very hard material and are then ground smooth and polished so as to work through the clay with the least possible friction and power. They form a continuous thread on the shaft, being made in halves and the edges coming together so as to form a continuous spiral. These propellers are of a graduated diameter. At the large end of the case immediately under the hopper opening the propellers are 25 inches in diameter and are graduated to 22 inches in diameter at the commencement of the expressing screw. The screw is 22 inches diameter at the receiving end and 18 inches at the discharging end.

Unboxed weight about 18,000 pounds.

Length from outer edge of clutch pulley to face of die holder, 14 feet 3 inches.

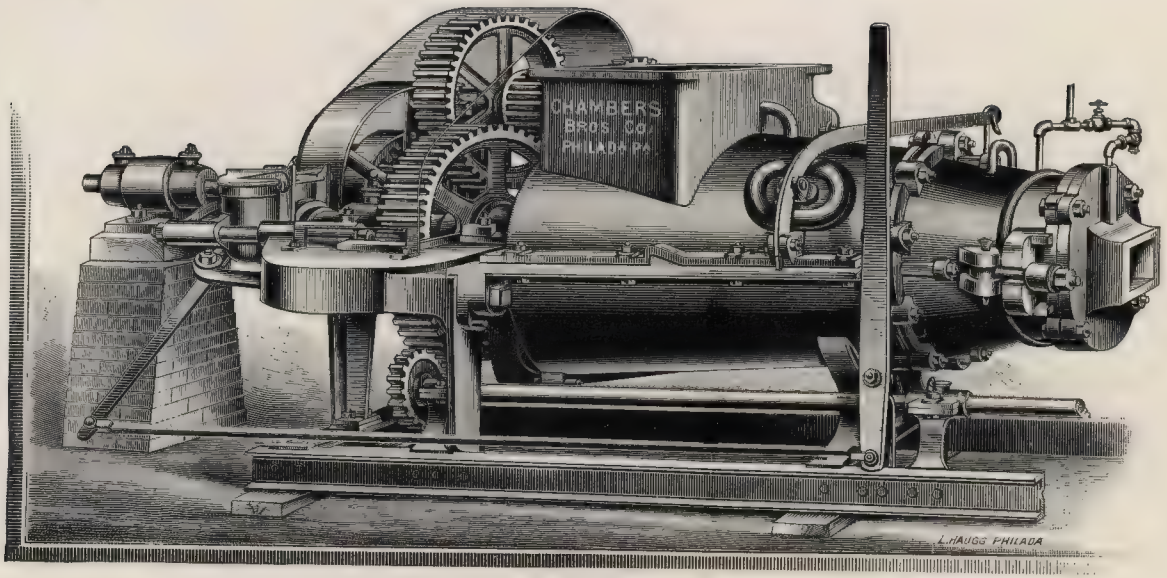
Height from under side of sills to top of hopper opening in case, 4 feet 4 inches.





The Chambers Standard Pattern Auger Machine, Fitted with Special Die Holder and Die for Hollow Block

The illustration is of a 5 x 8-inch block die.
Opening in die holder receiving the die plate is 17½ x 22½ inches.
Dimensions of opening into die holder from the auger case is 15 x 20 inches. The use of a hard iron "former" or shaping piece between the die proper and the rear face of die holder is recommended.



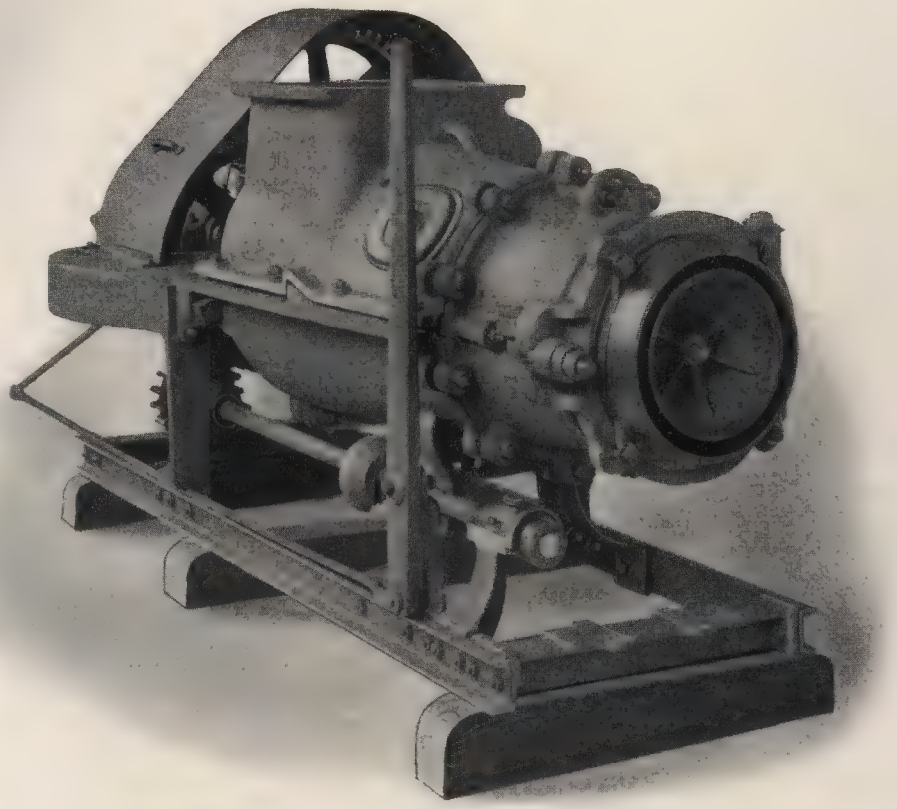
The Chambers No. 4 Size Brick Machine, with Side-Cut Brick Die

Guaranteed Capacity, 30,000 Bricks per Day.

This machine may also be constructed with the End-Cut Brick Die, Automatic Sander and Automatic End-Cut Table, shown on page 19.

It is mounted on an iron frame of 4-inch channels, has friction clutch driving pulley 30 inches diameter by 7 inches face, and steel pinions.

Length from outer end of driving shaft to face of die, 12 feet. Unboxed weight, exclusive of cutter, about 9,000 pounds.



Chambers No. 4 Size Auger Machine with Tile Die

Unboxed weight about 9,000 pounds.

Detail Dimensions

Length from outer edge of clutch pulley to face of die, 12 feet.

Height from under side of sills to top of hopper opening, 4 feet.

Friction clutch pulley, 30 x 7½ inches.

Driving shaft, $2\frac{15}{16}$ inches diameter between journals.

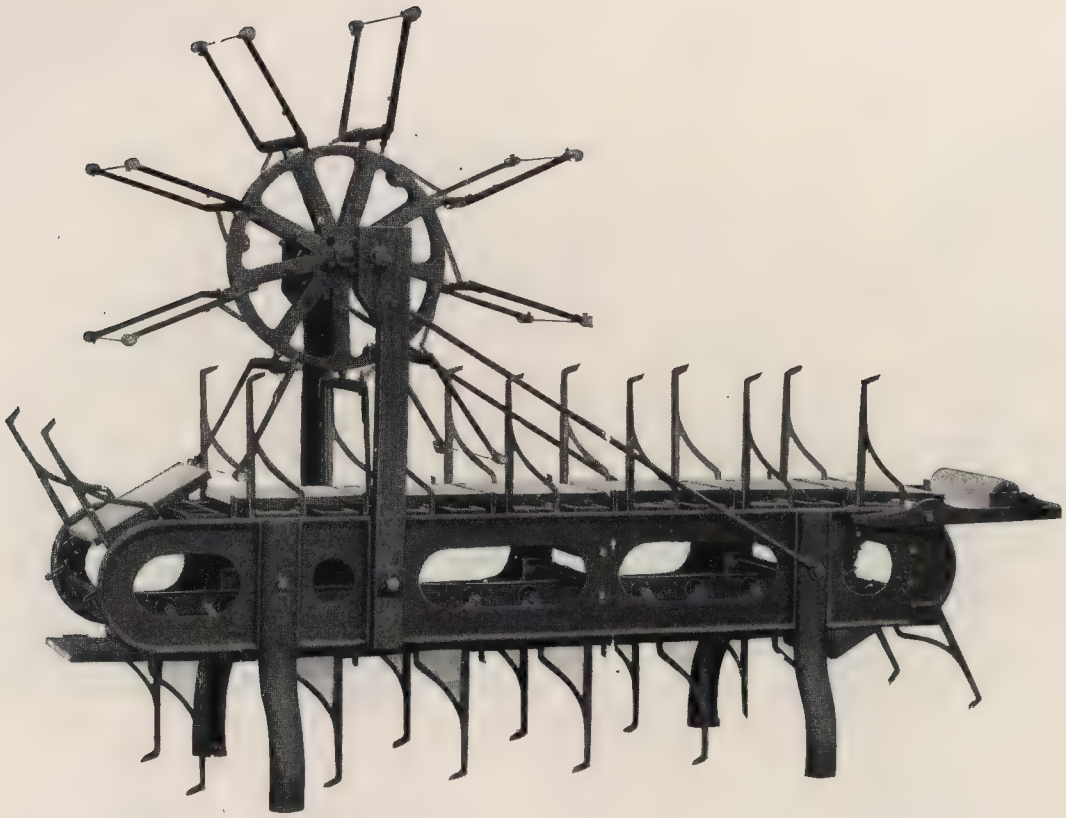
Countershaft, $3\frac{7}{16}$ inches diameter between journals.

Main auger shaft, 7 inches diameter.

Master gear and counter gear of semi-steel pinions moulded and of open-hearth steel.

List of Existing Patterns for Tile Dies

Tile Size	Drawing Number	Bore of Die	Diameter of Plug
3 inches	9-D-25	4.25 inches	Turned to order
4 "	9-D-26	5.6 "	" " "
5 "	9-D-42	6.8 "	" " "
6 "	9-D-27	8 "	" " "
7 "	9-D-43	9.2 "	" " "
8 "	9-D-28	10.4 "	" " "
10 "	9-D-44	12.8 "	" " "
12 "	9-D-24	15.2 "	" " "



The Bensing Automatic Tile Table, Arranged for Cutting Hollow Blocks

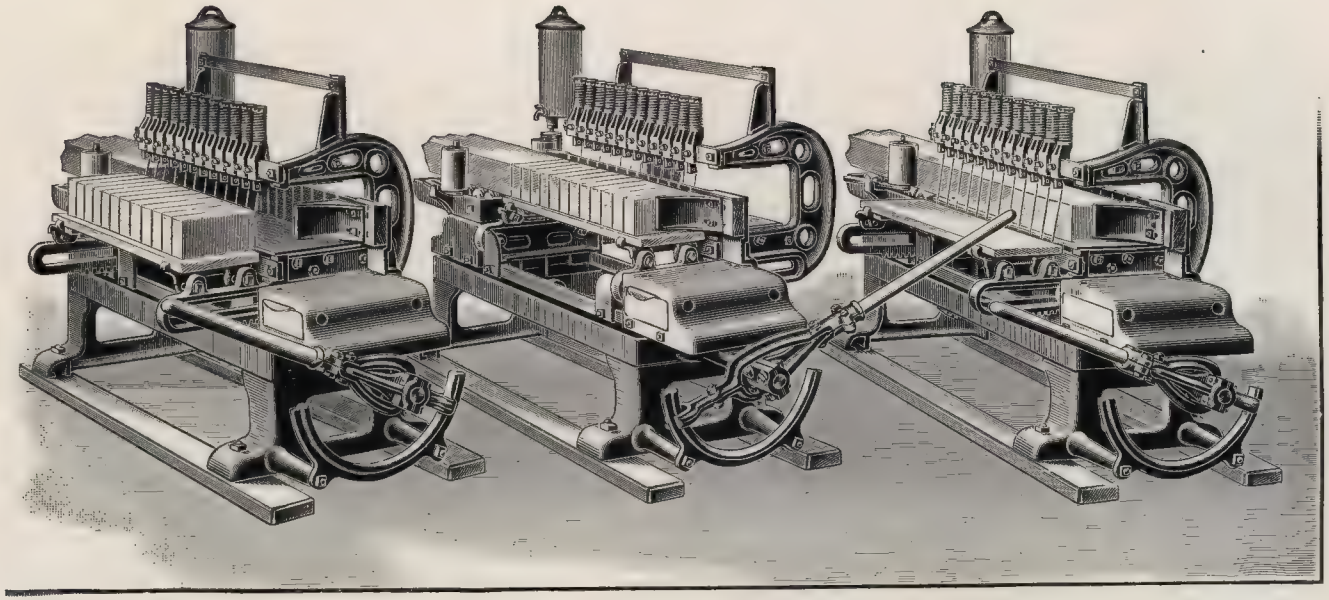
Made in Two Sizes.

No. 1, for block not larger than 10 inches high by 12 inches wide. Net weight about 1,000 pounds.

No. 2 for block not larger than 14 to 16 inches square, as ordered.

Tables are built to cut a specified length of block, but 13½ inches green measurement is regarded as standard.

Block Table No. 1 is 10 feet long over all. Height to top of reel, 6 feet 8⅝ inches.



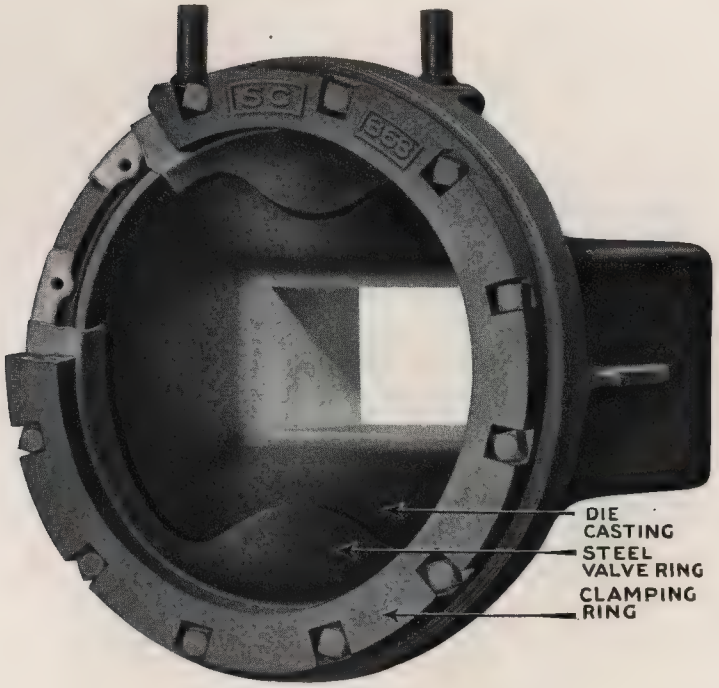
Board Delivery Cutting Tables

This table is easily operated and cuts twelve bricks at a time, drawing a smooth board under the bricks as they are cut. The upper portion of the table travels forward upon a track while the wires are being drawn through the column of clay, thus compensating for its forward motion. A slight pressure on the lever during its return stroke brings the table to its original position and places the board loaded with bricks ready for removal. Weight, about 900 pounds, unboxed. Length, including hand lever in operating position, about 9 feet.

Improved Pattern Board Delivery Cutter

Is arranged so that the cutting wires make a downward shear cut through the clay bar, thus producing smoother edges. Shipping weight, crated only, is about 1,700 pounds.

LUBRICATING BRICK DIES



Lubricating Side-cut Brick Die

(Patented Feb. 24, 1903)

Oil, soapy water, plain water and steam have all been used in connection with this die. The die proper is made of very hard metal and is cast to dimensions and shape ordered. Patterns for various sizes and for designs for both building brick and for paving block.

MAT-FACED BRICK

Our Auger Brick Machines are used for producing the widely advertised and fashionable "mat-faced," or wire-shaved building brick. It is impossible to produce the artistic effects of the genuine mat-faced unless the materials used be of suitable character and the processes of mechanical manufacture and of burning be properly adapted to the product.

Hinged Die Holder with our adjustable plate for securing one, two or three shaving wires. Adjustable for bricks of different dimensions. Provision for keeping the wires taut.

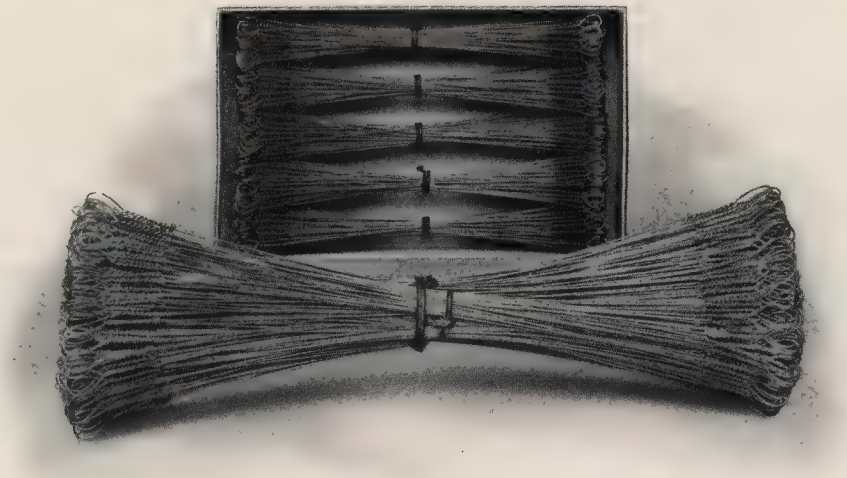
Side cut—103-B-16.

End cut—105-B-53.

Uniform Wires—Loops Double Twisted—Wires Straight—Ready for Use

Cutting Wires For Brick Machines

Chambers Bros. Co., Philadelphia, Pa.



A Box of 500 End Cuts and a Bundle of 500 Side-cut Wires

We have devoted particular attention to the manufacture of wires for our cutters, and endeavor to supply our customers with goods not only of the best material, of uniform temper, but also in condition for instant application, thus avoiding all possible loss of time. Our wires are straightened, double-twisted, uniform in length and in size of loop. There is no economy in having a brick machine stand idle while the operator "fusses around" with a crooked wire that is too long or too short. Wires of special length and gauge made to order.

The Manufacture of Blocks for Streets and Roadways

The Chambers Standard Pattern Auger Machines have won an enviable record in the production of this material. The end-cut machine in connection with our Indenting Round Corner Cutter may be constructed to mold a street paver to the required shape at one operation with the constituent particles intimately bonded and with the greatest amount of material per cubic inch of contents.

The low absorption of these blocks, their excellent showing under Standard Ratler Tests and their very satisfactory service in practical use all attest the superiority of this method of manufacture.

HILLSIDE BRICK AND BLOCK
SIDEWALK BRICK
CROSSING BRICK
FOUNDATION BRICK
SEWER BRICK
BUILDING BRICK
CRUSHED BRICK

CAPITAL PAVING BRICK AND BLOCK
AND
IMPERVIOUS FACE BRICK
MANUFACTURED BY

The Barber Asphalt Paving Company

Des Moines, Iowa

ADDRESS ALL MAIL TO
P O Box 565

Des Moines, Iowa Oct. 27th, 1909.

Chambers Bros. Co.

Philadelphia, Pa.

Dear Sirs:

We made 57,600 block on your machine the first day it was in operation. We are making block this morning at the rate of 9600 per hour, this being the second day of operation.

Very truly yours,

THE BARBER ASPHALT PAVING COMPANY

Manager.

HILLSIDE BRICK AND BLOCK
SIDEWALK BRICK
CROSSING BRICK
FOUNDATION BRICK
SEWER BRICK
BUILDING BRICK
CRUSHED BRICK

CAPITAL PAVING BRICK AND BLOCK
IMPERVIOUS FACE BRICK
MANUFACTURED BY

The Barber Asphalt Paving Company

Des Moines, Iowa

ADDRESS ALL MAIL TO
P O Box 565

November 11, 1910.

SUBURBAN BRICK CO.,
Wheeling, W. Va.:

Gentlemen:--We have for acknowledgment your inquiry of November 9th, and are pleased to advise that we are operating a Chambers End-Cut Brick Machine with Automatic Cutter, Indentor and Edger. We manufacture both vitrified paving brick and block and vitrified hollow brick and block on this machine. * * *

The machine has been in operation something over a year, and we have had no repairs whatever other than renewal of dies and augers. We have cut 180 block size per minute, equivalent to 316 standard size brick per minute. We have no difficulty in making 75,000 block per day of nine hours. * * *

We have a very much superior product.

Very truly yours,

THE BARBER ASPHALT PAVING COMPANY.

Non-Repressed Paving Blocks

To Charles H. Frost, of Los Angeles, Cal., has been issued patents covering the method of automatically depressing or opening spaces in the ribs formed by the die upon the moving clay bar, thus permitting the cement to flow to the bottom of the block when laid. Manufacturing licenses under these patents may be obtained from Mr. Frost upon reasonable terms. The Chambers machines are particularly well adapted and are used to produce the blocks under these patents. The method saves the labor and expense of repressing and leaves the paving block without any disturbance of its structure established when molded by the auger machine, during which process it was subjected to a greater pressure than is maintained during any subsequent repressing operation.

Los Angeles Pressed Brick Company

Manufacturers of

Pressed, Enameled, Fire, Paving and Common Brick
Fireproofing. Roofing Tile. Mantle Tile

FROST BUILDING
4TH FLOOR

Los Angeles.

May 6, 1913.

CHAMBERS BROS. CO.,
52d and Media Streets, Philadelphia, Pa.:

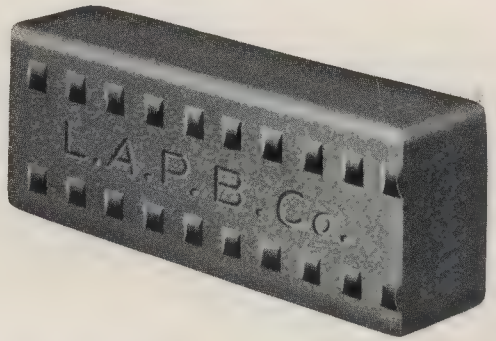
Gentlemen:--Your favor of the 29th ult. is received. I would be glad to have you continue your advertisements of process for making end-cut paving brick without repressing, referring to the Frost Process Company, Commercial National Bank, Chicago, for license.

We always used your indenter in making paving blocks. It makes a more finished product.

I enclose copy of letter to Denny Renton Company.

Yours truly,

(Signed) CHAS. H. FROST.



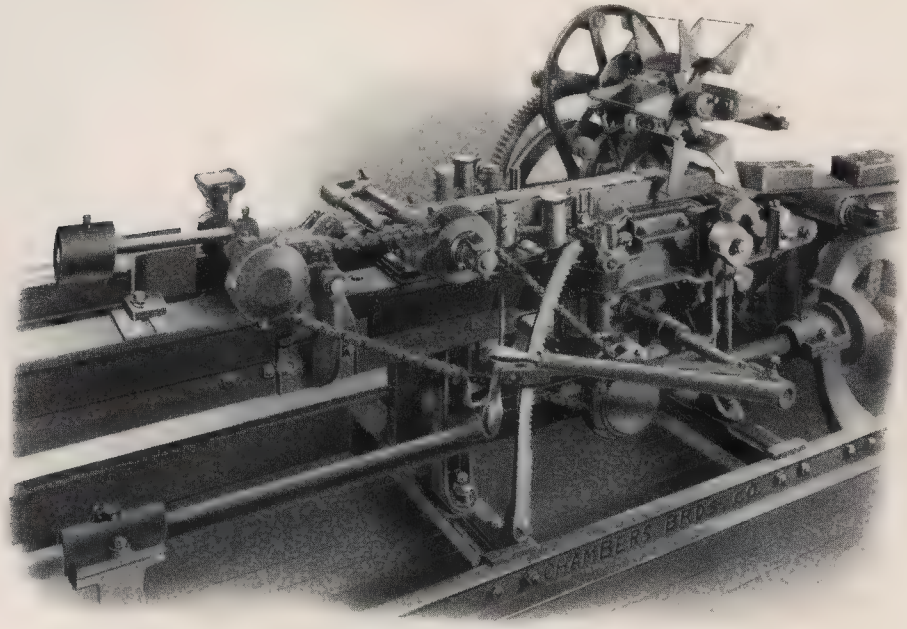
The Non-Repressed End-cut Paver

Produced on the Chambers End-Cut Standard Auger Brick Machine with Automatic Indenting Cutter.

The Manufacture of Blocks for Streets and Roadways

Our special End-Cut Paving Block Dies will produce block with edges square or rounded upon any desired radius, and with surfaces plain, grooved or with one or more projecting beads.

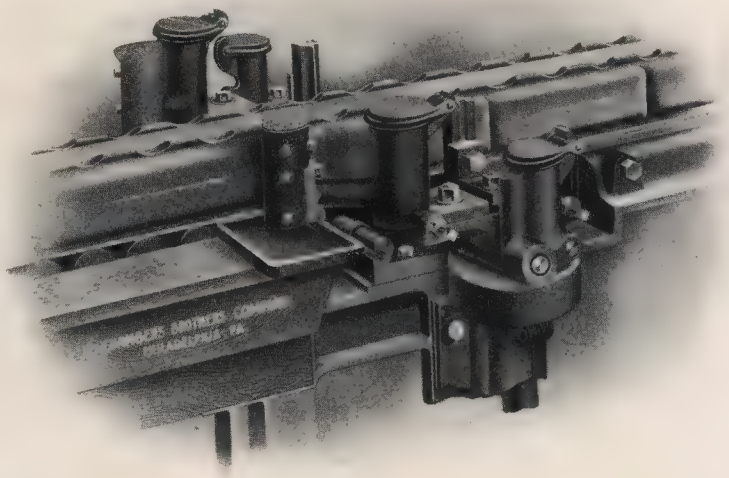
The Automatic Round-Corner Brick Cutter indents the two side faces of the clay bar at predetermined intervals corresponding with the path of the cutting wires, so that the severed brick or block may have a rounded edge at its end, corresponding in radius with that formed by the die.



The Automatic Indenting or Round Corner Brick Cutter

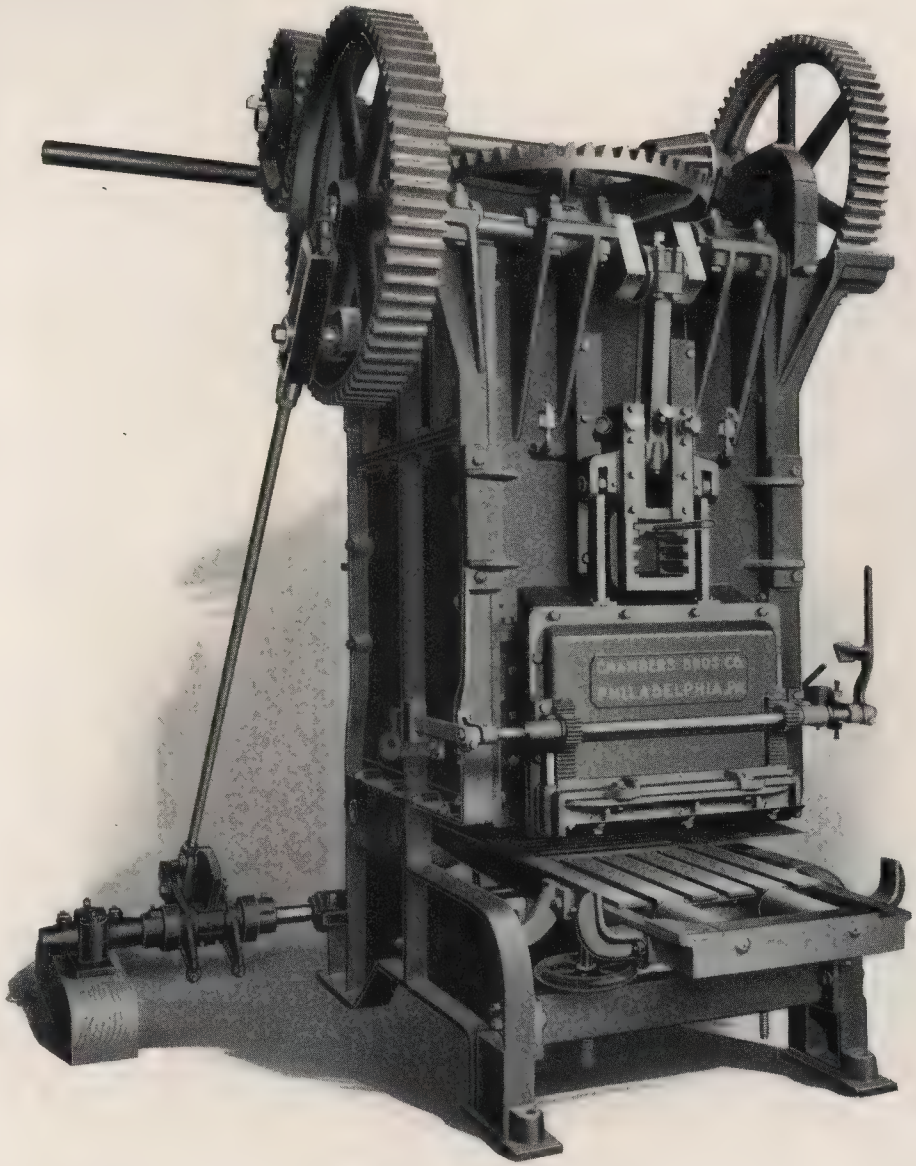
(Patented)

Built under license from the Staley and Underwood patents.



Illustrating our device for oiling the side faces of clay bar at predetermined intervals to prevent clay from sticking to the indentor steels.

(Chambers and King Patents, Dec. 28, 1909.)



Weight about 18,600 pounds.
Will mold fire bricks and refractory blocks.

"The Belmont" Sand Molded Brick Machine

Constructed of iron and steel and designed along well-established lines for machinery of this class.

Improved relief mechanism for mold pusher, located at rear of machine away from interference with operatives and from waste material.

Plunger box is enclosed and surplus clay discharged back into the main chamber.

Machine built for either right or left feeding.

Mold table adjustment made by four screws with hand wheels operated separately or connected in pairs, if preferred.

Access to inside of main chamber through opening, 33 x 24 inches, covered by one piece of boiler plate, conveniently removable.

One-piece crank shaft of forged steel. Three journal bearings on crank shaft.

All gears of liberal face and substantial pitch; the crown gear being provided with vertical adjustment for maintaining correct mesh between gear and pinion. All large gears of semi-steel with driving pinion of cast steel. Crown gear and its pinion are both molded from cut metal patterns.

Metal guards cover exposed movements liable to occasion injury to workmen. Very marked improvements in both upper and lower journal bearings for main knife shaft, these bearings being well protected and lubricated.

Knives of steel, secured by keys and adjustable. No projecting bolts or nuts are used for fastening knives, and shaft revolves through clay with greater ease.

The driving shaft located toward the rear of machine well above the clay entrance, and with its journal bearings of liberal dimensions and protected.

Cross-head of cast steel. Plunger connecting rods of steel.

The Keystone Crank Repress

The Keystone is a strongly-built press of the pattern employing direct crank movement, and is so constructed that a separate and distinct pressure is applied to the lower side of the brick. This is secured through the use of a hardened steel-faced cam in contact with a cam roller 5½ inches diameter connected with the lower cross-head and causing the lower plungers to move upwards through the press-box in proper time with the stroke of the double cranks giving downward motion to the upper plungers.

Recognizing the importance of stiffness and great strength as factors in securing the full benefit of these movements on its finished product, the press has been closely built in addition to making all working parts of large diameters. The distance between connecting rods is only 46½ inches and the crank shaft itself $5\frac{5}{16}$ inches diameter. These dimensions, in connection with similar proportions of other parts, result in a repress of enormous strength.

The cam roller pin is of large diameter and secured to the cross-head in a very simple manner and is so accessible that both pin and roller may be easily and quickly removed without dismantling the repress in any way.

The lower cross-head slides are long and wide, with most excellent provision for oiling. The close distance between the connecting rods on the Keystone adds very greatly to the strength of its upper cross-head as compared with one of similar section but of greater length. Metal shields cover the gears and pinions, and the cam and its roller are protected against falling dirt.

The mechanism for moving the charger feeding and delivering the brick on the Keystone has been most carefully and successfully planned. It is in perfect time with the pressing movements, places the incoming clot exactly where wanted and delivers the finished brick or block upon the carrying belt with a smooth, easy motion without mutilation. The charger motion is derived directly from one of the cranks extended to receive a connecting rod. The other end of this rod connects with an arm secured to a rock shaft journaled in both side frames of the repress. The location of this rock shaft relative to the crank shaft is such as gives a perfect timing of the charger relative to the plunger movements. There is mounted upon the rock shaft a bifurcated arm, and from the extremities of both branches of this arm connecting rods reach to the charger.

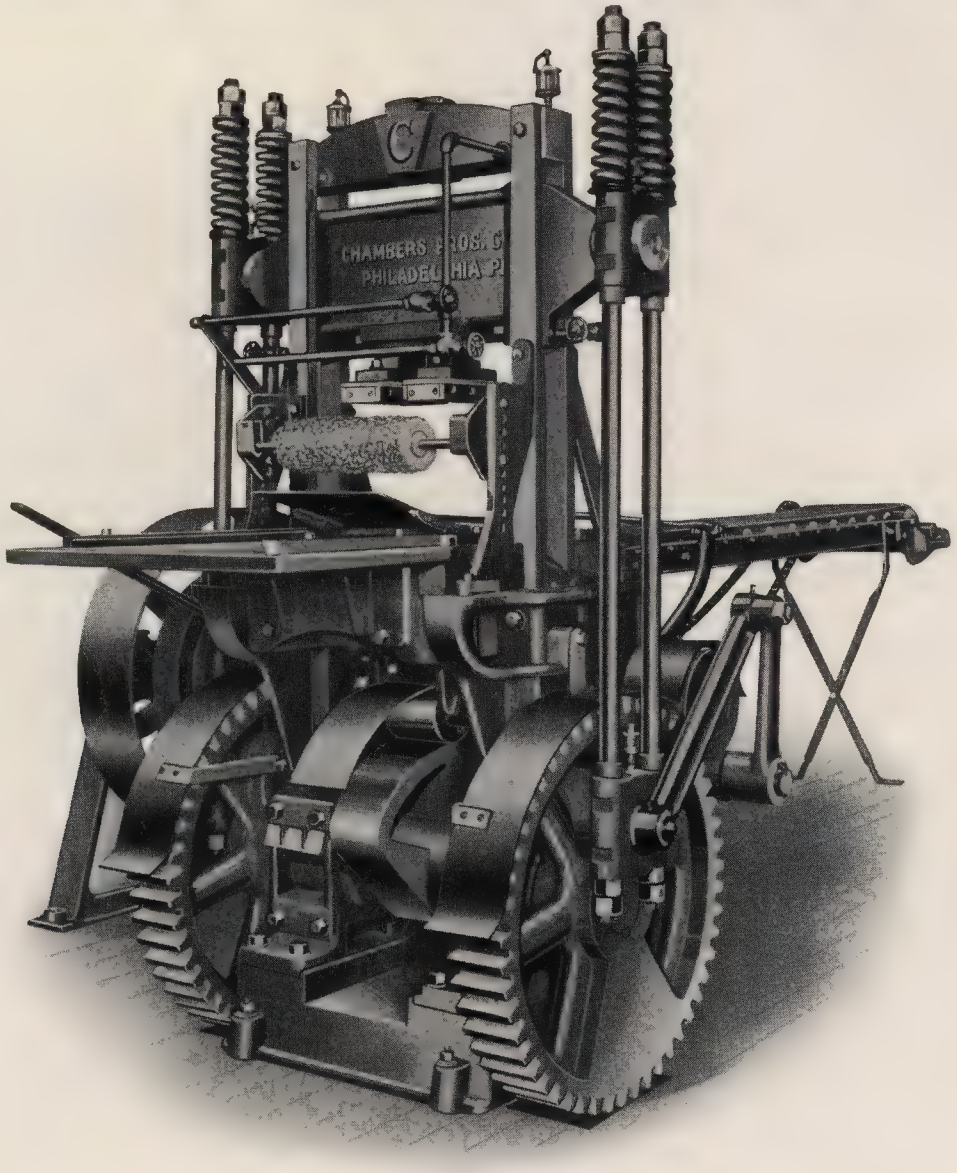
The anvil blocks for upper plunger plates are fitted for steam connection.

The cross-rail at the top of guide-bars is a chambered casting provided with a self-closing lid and serving as a receptacle for oil that may be used to lubricate the brick. The chamber is large enough to hold several gallons and makes a neat dirt-tight reservoir with separate feed pipes from either end.

Either of two styles of feed table will be supplied. The illustration shows the style recommended, consisting of an inclined steel plate secured to and moving with the charger. The brick slide easily down this inclined surface into the charger and the mechanism is free from traps liable to catch a man's fingers, so common on stationary tables with charger moving beneath. In connection with this style of feed table the press foundation is made such height as brings the inclined feed plate at a convenient position.

The main bed-plate casting is chambered and shaped to gather the oil dripping from the press box.

The Keystone Repress—Built in Four Sizes



Adapted to different classes of product.

The Keystone Crank Repress

Number Four

The No. 4 KEYSTONE is a development brought about in connection with the demands of our customers in the Fire Brick Trade. Press box 7¼ inches deep. Greatest length, 20 inches.

NO. 4 HAS CRANK SHAFT FORGED FROM CHROME NICKEL STEEL.

ROLLER AND PIN are very important items in a machine of this kind. The roller is of very large diameter, made of hardened steel, and has a phosphor-bronze sleeve running on a hardened tool steel pin. The provisions for lubrication and for removal of roller and pin are most excellent.

Both upper and lower cross-heads are of cast steel.

Unboxed weight about 8,000 pounds.

Number Three

Represses 9-inch fire brick on edge, thus insuring uniformity in thickness.

Delivers a repress block as much as 6⅝ inches thickness.

Pressing two brick at a time the limit is 6½ x 13 inches. One block at a time as large as 11 x 16½ inches. One tile at a time as large as 13½ x 16½ inches. Key and wedge brick and cupola block.

Both upper and lower cross-heads are of cast steel.

The cam is 6 inches face, of large diameter and fitted with a hardened steel shoe.

Unboxed weight about 7,700 pounds.

Number Two

Has hammered steel crank shaft. Heavy cast-iron cross-heads.

Will deliver a block as much as 4 inches thick.

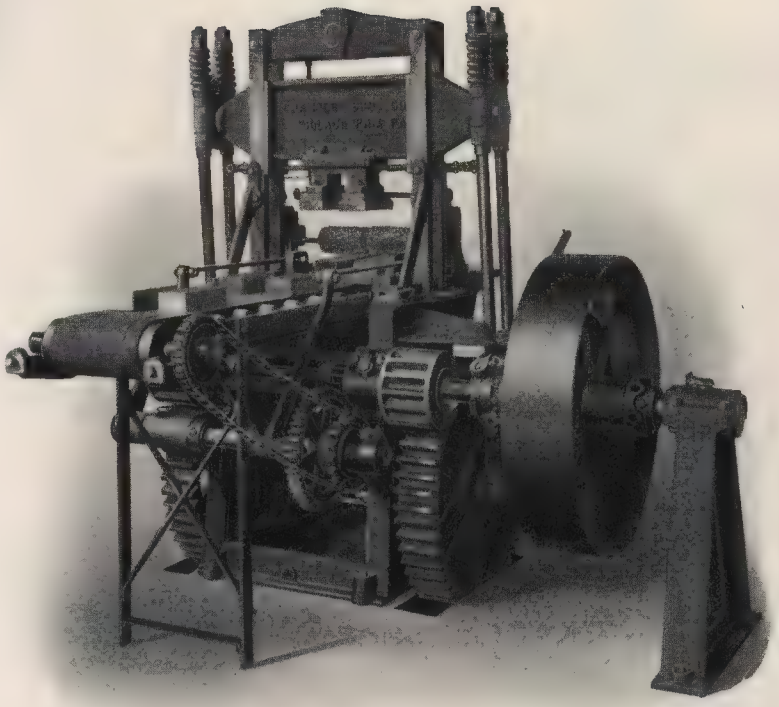
Largest dimensions of box for pressing one block at a time is 11 x 16½ inches. Maximum size when pressing two blocks is 6½ x 13½ inches for each.

Number One

Is constructed of same materials as Repress No. 2. Keystone Repress No. 1 has been made to cover the requirements of the average run of repress work rather than sacrifice anything in its convenience, strength and durability in order to include some occasional and very unusual size.

The KEYSTONE No. 1 will deliver two finished brick or block of thickness ranging from 1½ to 4⅛ inches.

The width may vary from 3½ to 5½ inches and length from 8 to 11 inches.



Keystone Repress No. 1

Showing delivery side. Net weight about 7,200 pounds.

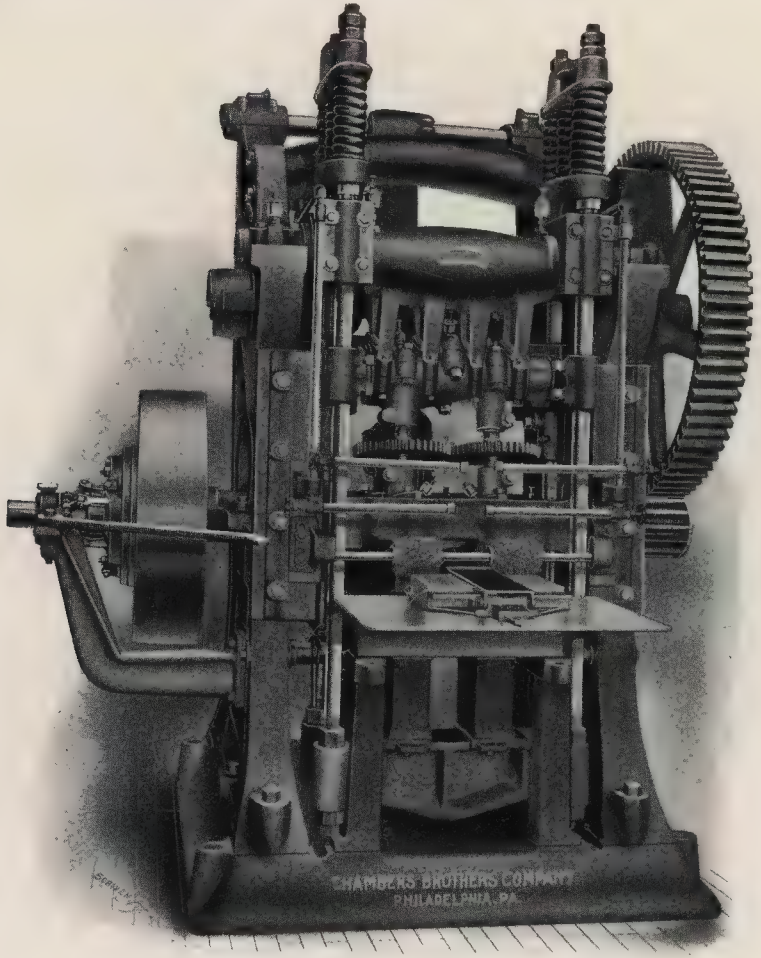
The Keystone Represses

ARE IN USE BY

The General Refractories Company at

Blue Ball, Pa., Factory.
Olive Hill, Ky., "
Hitchens, Ky., "
The Kentucky Fire Brick Co., Portsmouth, Ohio.
Winslow & Co., Portland, Me.
Joseph Oschwald, Cliffwood, N. J.
The New Jersey Company, Matawan, N. J.

Philadelphia Repress No. 2



Front View, With Gear Cover Omitted

In this we offer a combined crank and toggle press of great strength. It is a two-mold press with the operating machinery above the mold box.

All of the operations are derived from a single crank movement, resulting in an extremely smooth, easy-running machine, making comparatively little noise and working without abrupt, jerky motions.

The whole press is mounted upon a substantial box pattern iron bed plate, having planed faces to which the side frames are bolted. These are of substantial design, ample to carry the working machinery. All shafts are of liberal size mounted in babbitted bearings made with removable caps machined and carefully fitted to place.

The toggle pin is $2\frac{15}{16}$ inches diameter, rigidly secured in the upper toggle arm. The bearings of the connecting rod on this pin are babbitted and made with removable caps. None of the strain of pressing the bricks comes on the side frames, but is all taken by four heavy steel rods carrying a cross-head to which the lower plungers are bolted. All plungers have their edges faced with hardened steel easily removed and adjusted for wear.

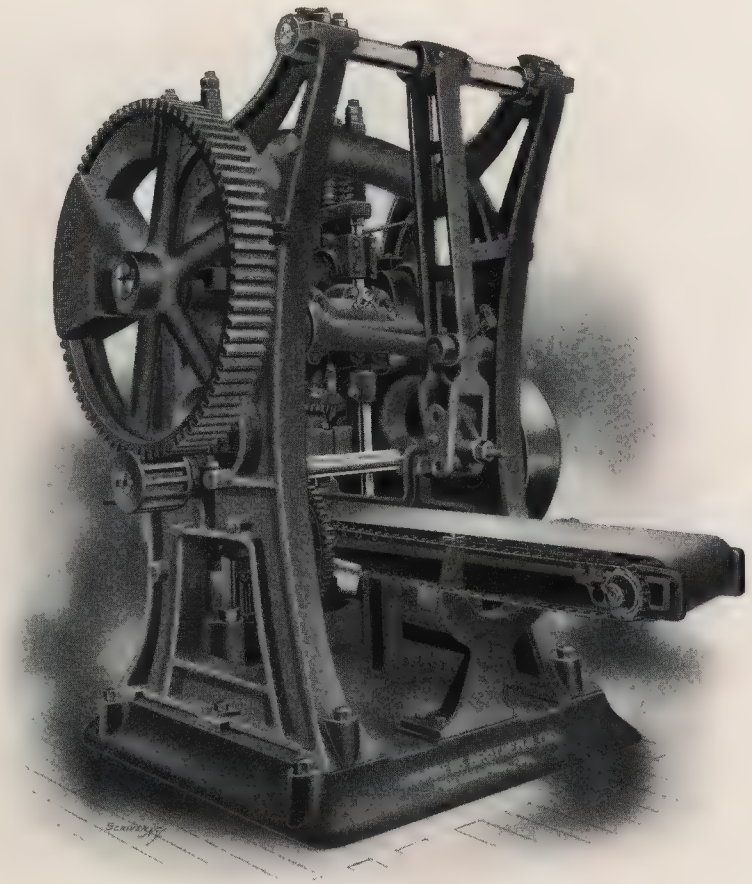
Three heavy coil springs on each side placed at the upper end of the side rods can be adjusted to regulate pressure upon the bricks. During the pressing movement the lower plungers are moving upward while those above move downward, thus pressing the brick from both sides at once.

The crank is of open-hearth steel and is 7 inches diameter. From this single crank all the operations of the press are derived. The feeder and charger is actuated by a swinging arm shown in the illustration, and provided with a simple means of regulating the length of stroke, as well as the position of the feed.

Even at high speed the incoming bricks are correctly placed and the finished ones delivered smoothly upon the carrying-off belt. The upper plungers are secured to a cross-head having very liberal guide surfaces, securing alignment with minimum wear. Adjustment for thickness of brick is secured by right and left threads on the toggle connecting rods, the two being geared together to secure parallel adjustment, thus making it impossible to throw working parts out of line.

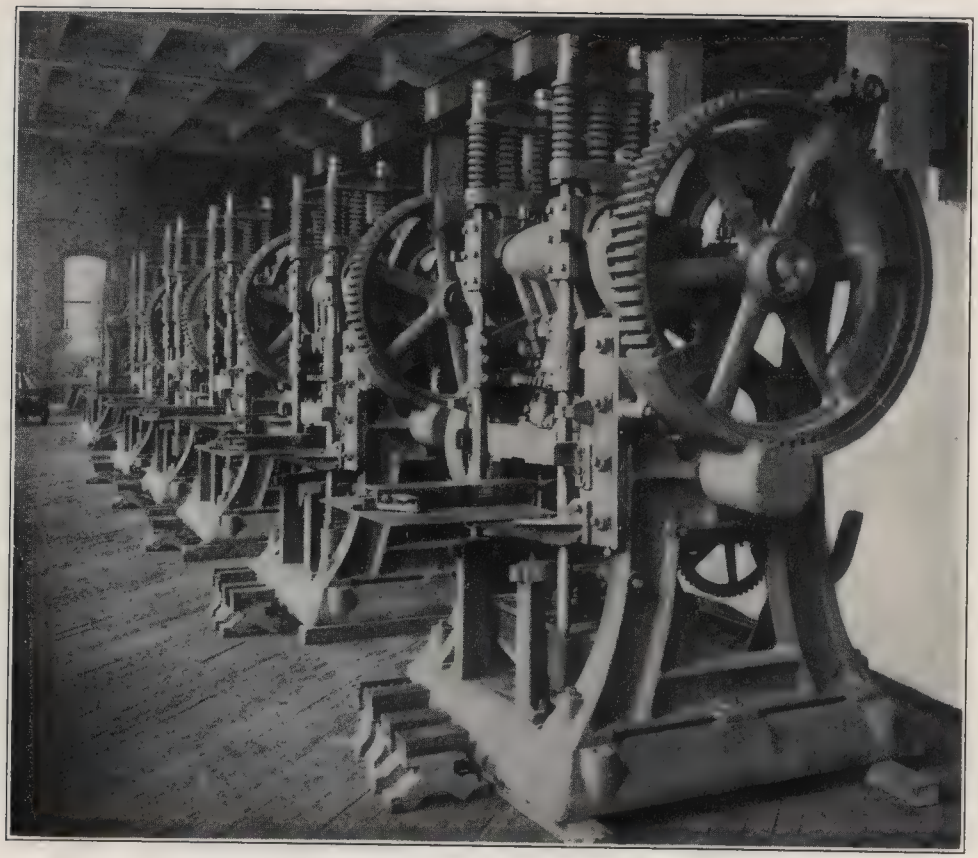
Pressing two brick at a time, the range in dimensions is from a minimum size of $1\frac{3}{4}$ inches thick by $3\frac{1}{2}$ inches wide by 8 inches long to a maximum size of 4 inches thick by 6 inches wide by 11 inches long.

The driving gear is of ample dimensions, the pinion being of steel. The clutch pulley is 30 inches diameter by 6 inches face, a 5-inch belt being ample.



The Philadelphia Repress No. 2, Rear View, Showing Delivery Mechanism

Weight of press unboxed about 12,000 pounds.
Bed plate 5 feet long by 4 feet 8 inches wide.
Height from floor line to top of side rods 8 feet 7 inches.
Delivery belt made of length to suit customers' requirements.
Gear and pinion are enclosed.



A Shop Line of Philadelphia Represses

Weight of each Repress about 12,000 pounds unboxed.

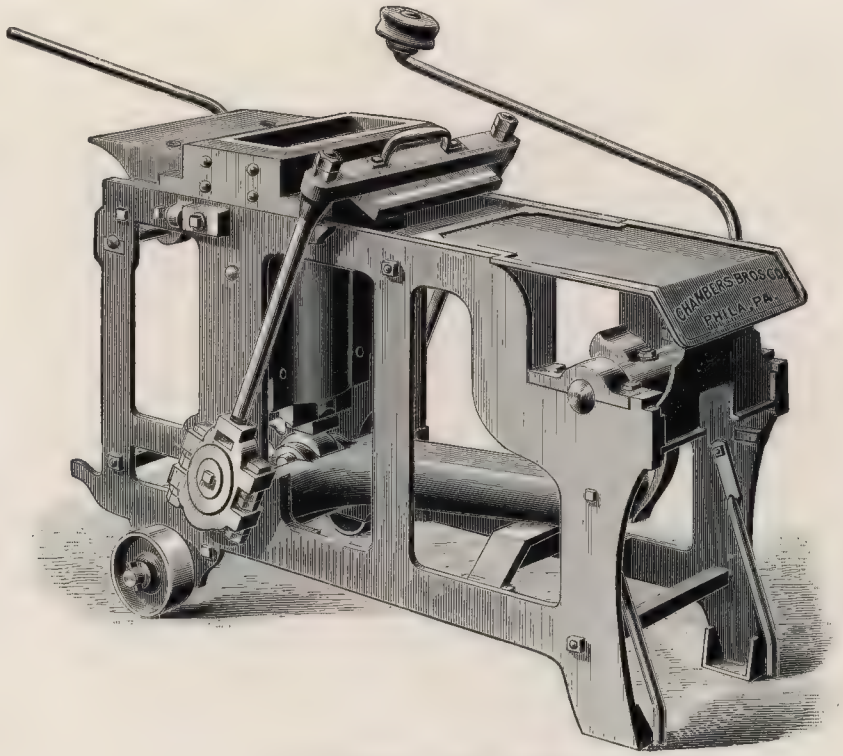
A combined toggle and crank movement.

Normal load for the six relief springs is 33,000 pounds.

If necessary these springs will carry a load from 25 per cent. to 40 per cent. in excess of above.

Safe working load for the tie rods on this press 64,000 pounds.

Load for lower beam 90,600 pounds. For upper toggle 96,000 pounds.



Hand Power Brick Press

For repressing bricks molded by the Chambers machine, by hand, or by soft-mud machines. This is a very powerful press, having steel-lined box with top plate and plunger faced with steel, conveniently arranged for refitting when necessary.

It can be readily moved from place to place about the works, weighs about 900 pounds, and occupies a floor space of 20 inches by 3 feet 6 inches, exclusive of lever.

Ornamental corner pieces may be used for repressing ornamental shape bricks. Name plates or trade-marks can be attached to the lower plunger, and special press boxes to form round edges and corners can be fitted to this press.

The Hand-Brick Press

of standard pattern is designed for repressing ordinary-size building brick, but may be built for green floor tile not exceeding 9¼ inches square.

Special Hand Press

For large-size block work. Has two pressing levers, one on each side of press, requiring two men to press the work. Has an independent discharge lever.

Maximum dimensions of box 16 inches long by 8 inches wide. Depth of pressed block about 6 inches.

Unboxed weight of press is about 1,600 pounds.

CLAY PREPARING MACHINERY

Clay Granulators and Feeders

Single and Double-Shaft Pug Mills

Combined Clay and Sand Mixers

Measuring and Feeding Machines

Water-Jacketed Mixers

The C. A. Wentworth Washing Machine

For Separating Ores from Argillaceous Material

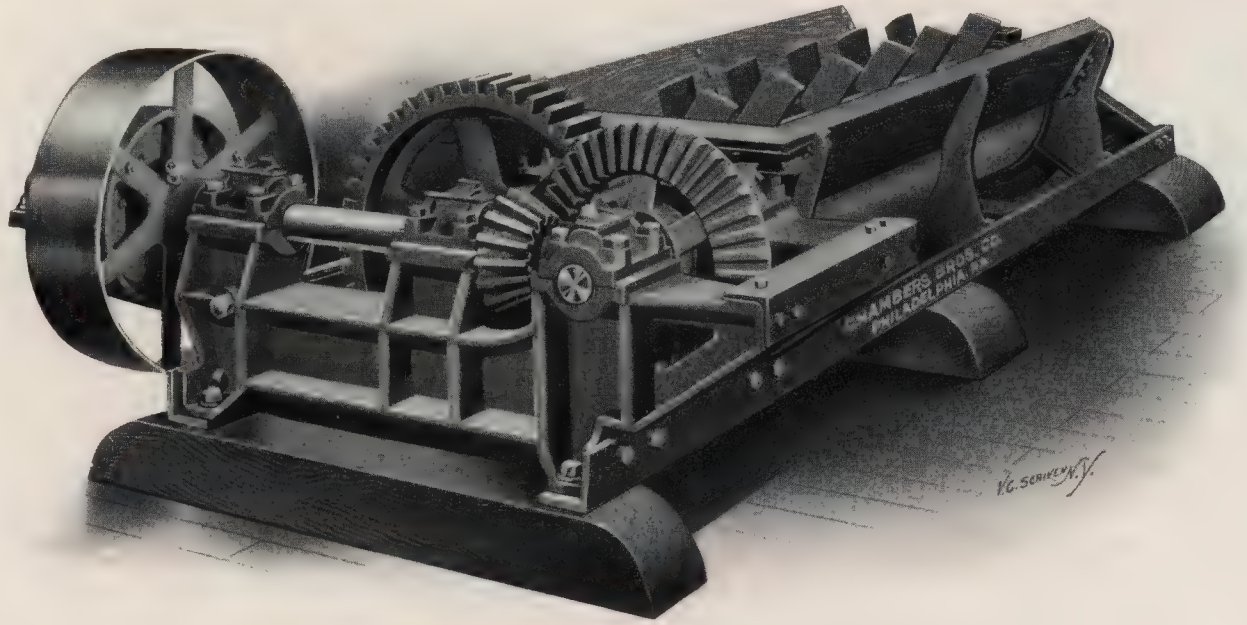
The importance of proper preparation of the clay and the thorough mixture of different ingredients entering into the manufactured product can scarcely be overestimated. Defects appearing only after the completion of subsequent processes are frequently traced to deficiency in preparation.

We have developed a line of clay-preparing machines of different capacities and of patterns to suit different installations. Some of these, not illustrated, are catalogued by drawing numbers only, as a means of convenient record.

Horizontal Clay Granulators and Feeders

These machines receive clay in carload lots, will shave the lumps into smaller pieces and immediately commence the mixing of clay and sand or different strata. One of the most valuable features of a granulator is that it saves labor in feeding and insures a uniform supply of material to the subsequent machinery, the hopper over the granulator serving as a reservoir. The knives in the granulator shaft are adjustable and can be set to feed a given amount of clay per minute so long as there is in the tub of the machine sufficient clay to cover the shaft.

This machine is designed to work on a horizontal plane, and may have the gearing placed at the discharge end entirely away from the falling dirt at the entrance end. It is made with both sides of the tub flared, as shown, or with one side only flared, the other conforming to a vertical line. The main shaft is of hammered steel 8 inches in diameter carrying forty forged steel knives. The driving and counter pinions are of steel, and all gears are journaled in an iron frame bolted to heavy steel angles. Clay may be dumped by the carload into this machine and in lumps as dug by steam shovel.



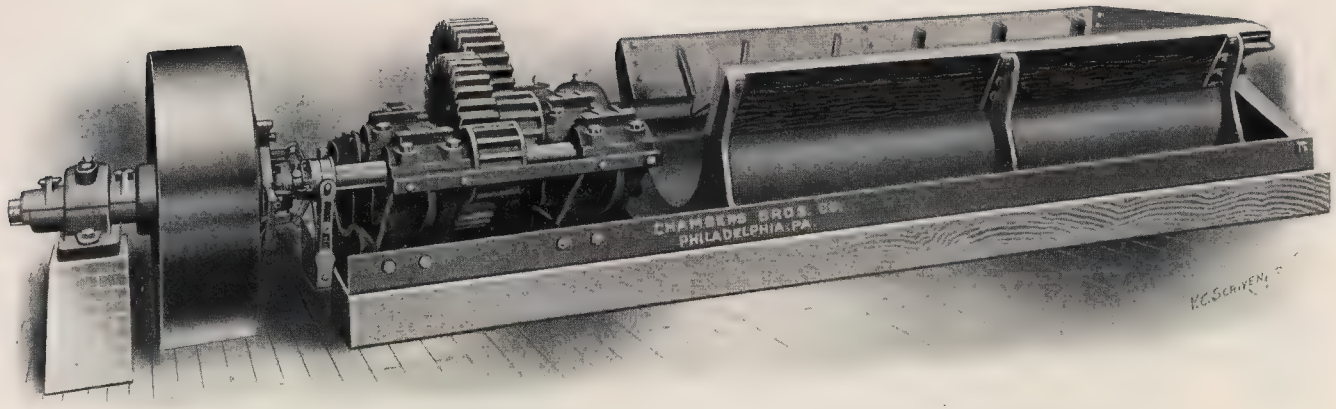
Bevel Geared Clay Granulator and Feeder No. 14

The friction clutch pulley is 40 inches in diameter by 12-inch face.

Length of frame, 19 feet. Width, 5 feet 6 inches.

Height from bottom of frame angle to top of flared hopper, 3½ feet.

Weight of machine unboxed is about 14,500 pounds.

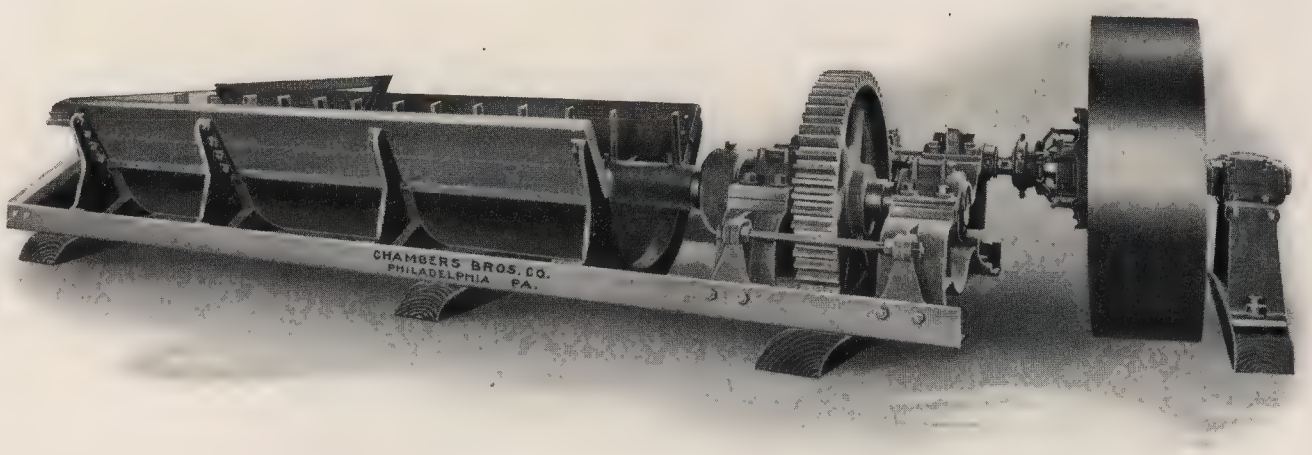


Double Spur Geared Clay Granulator and Feeder No. 14 S

The illustration shows discharge of clay towards the gear end of machine, but this may be reversed. Standard length of tub is 10 feet, with 8-inch diameter steel shaft carrying 40 forged steel knives.

The driving and counter pinions are of steel, and all gears are journaled in an iron frame bolted to heavy steel angles. Clay may be dumped by the carload into this machine and in lumps as dug by steam shovel.

The friction clutch pulley is 40 inches in diameter by 12-inch face.
Length of frame, 19 feet. Width, 5 feet 6 inches.
Height from bottom of frame angle to top of flared hopper, 3½ feet.
Weight of machine unboxed is about 14,000 pounds.



Single Spur Gear Granulator No. 50

Drawing No. 96-C-36. Unboxed weight about 16,000 pounds.

Nine-inch diameter steel shaft. Tub 12 feet long—48 knives.

Forged steel pinion—semi-steel master gear with cut teeth.

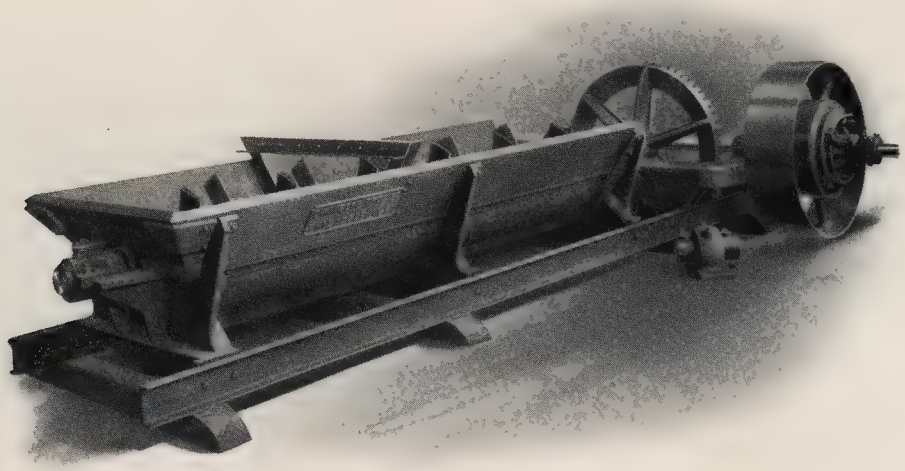
Friction clutch pulley 60 inches diameter by 18-inch face, fitted with No. 10 clutch.

Main frame 19 feet 8 inches long by 5 feet wide at gear end.

Height from bottom of frame to top of flared hopped is about 3 feet.

The No. 30 Series of Granulators and Feeders

For capacities from 3,000 to 6,000 bricks per hour. Built upon the same lines as our heavier machines.



Bevel-Geared Clay Granulator No. 30

Standard length of tub 10 feet. Hammered steel shaft 6 inches diameter.

GRANULATOR No. 30.—Bevel Geared Pulling Pattern. Tub 10 feet long. Machine over all 16 feet 3 inches. Clutch pulley 44 inches in diameter by 12-inch face. Drawing No. 89-C-88. Unboxed weight about 9,000 pounds.

GRANULATOR No. 31.—Bevel Geared Pushing Pattern. General dimensions same as No. 30. Drawing No. 89-C-86. Unboxed weight about 9,000 pounds.

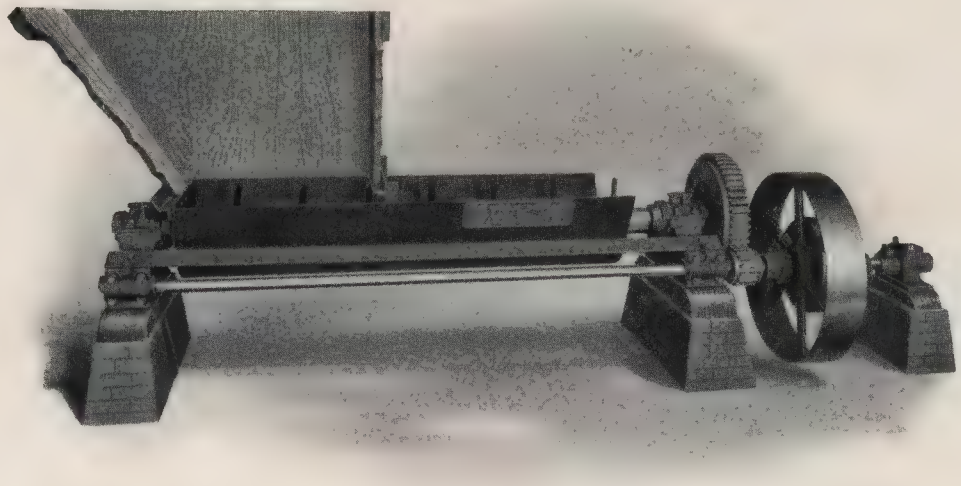
GRANULATOR No. 32.—Spur Geared Pulling Pattern. Tub 10 feet long. Length of frame over all 16 feet 3 inches. Friction clutch pulley 40 inches in diameter by 12-inch face. Drawing No. 89-C-84. Unboxed weight about 8,500 pounds.

GRANULATOR No 33.—Spur Geared Pushing Pattern. Same general dimensions as No. 32. Drawing No. 89-C-87. Unboxed weight about 8,500 pounds.

The No. 42 Series of Granulators and Feeders

Drawing 104-A-14.

For capacities up to 4,000 bricks per hour.



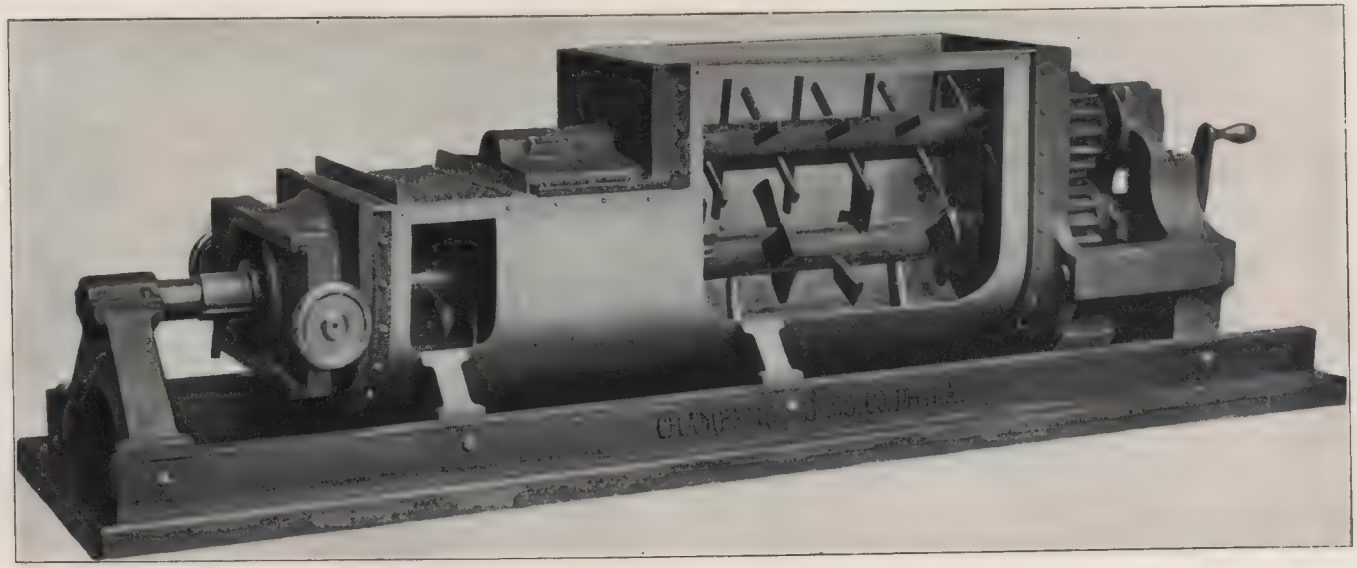
Has 4¾-inch square hammered steel shaft with 27 knives adjustably secured. Tub 7 feet 6 inches long.

Friction clutch drive pulley 36 inches diameter by 8-inch face.

Driving shaft $2\frac{7}{16}$ inches diameter with 3 journal bearings. Unboxed weight about 2,300 pounds.

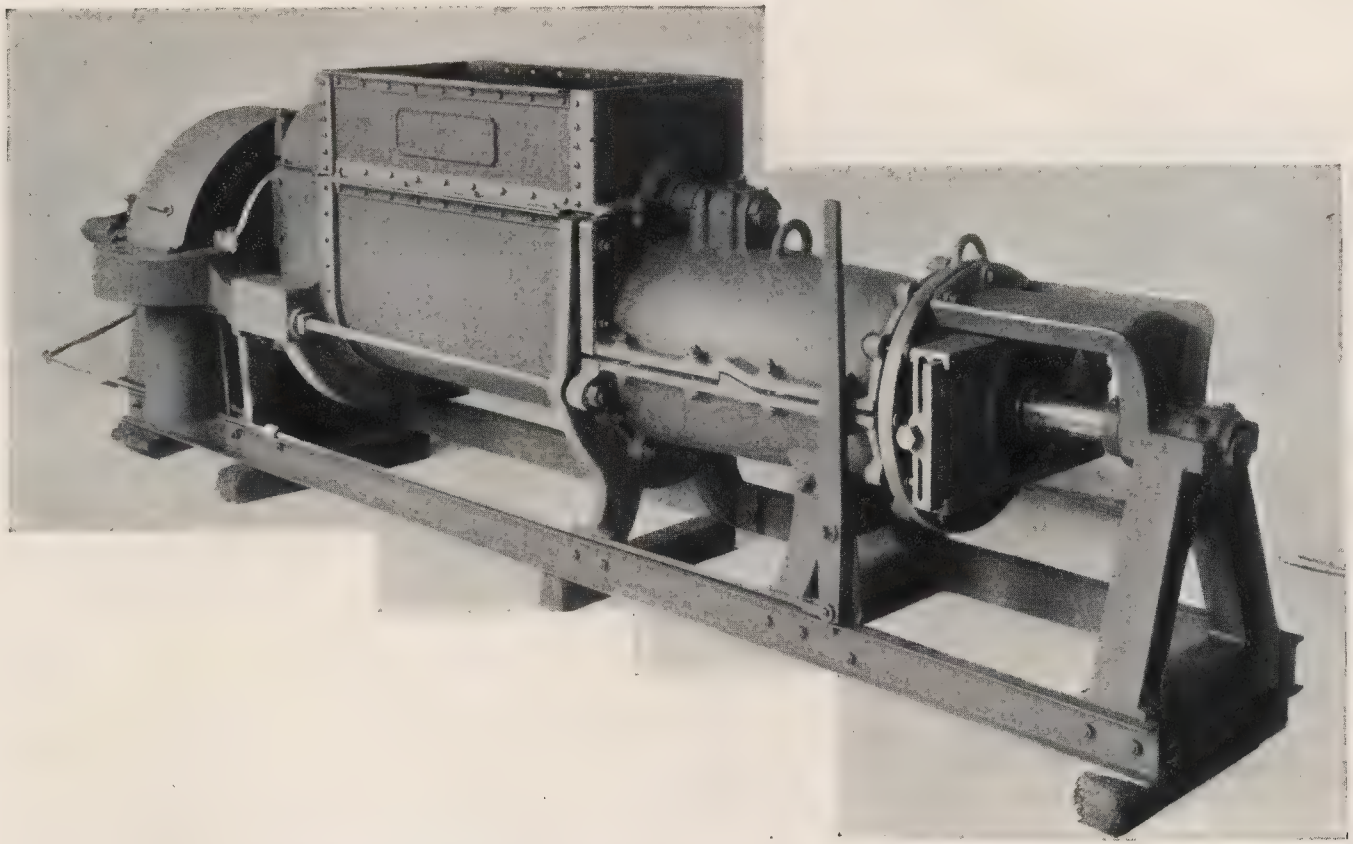
Double Shaft Combined Mixing and Pugging Machines

Designed for mixing two or more ingredients, or dry and wet materials, and delivering a thoroughly mixed, well-pugged mass in uniform quantity. Especially valuable for mixing "grog" or ground calcined material with plastic clay, ground shale with tough clays, and other finely ground or granular material with plastic binders



Photographic reproduction from working model of the No. 1 Combined Mixing and Pugging Machine, showing arrangement of the two shafts and sets of knives.

In this machine we have combined the features of the Double-Shaft Mill for mixing different materials with the long enclosed case containing single shaft only for pugging stiff plastic clays. The main pug shaft is of hammered steel 7 inches diameter, and is fitted with our regular steel-faced tempering knives, adjustable to any desired position. Immediately over this shaft and extending for about one-half the length of the pug chamber is an independent mixing shaft carrying four rows of steel bars so located that they just clear the tempering knives in the main shaft. The distance between the two shafts only slightly exceeds the lengths of the knives. The operation of these two shafts in the material with the close passage of the knives to each other secures a thorough mixture of different ingredients before reaching that part of the chamber in which the process of pugging is completed. The rear portion of the pug chamber is open at the top, thus giving ample opportunity for examination of material and for regulating water supply.

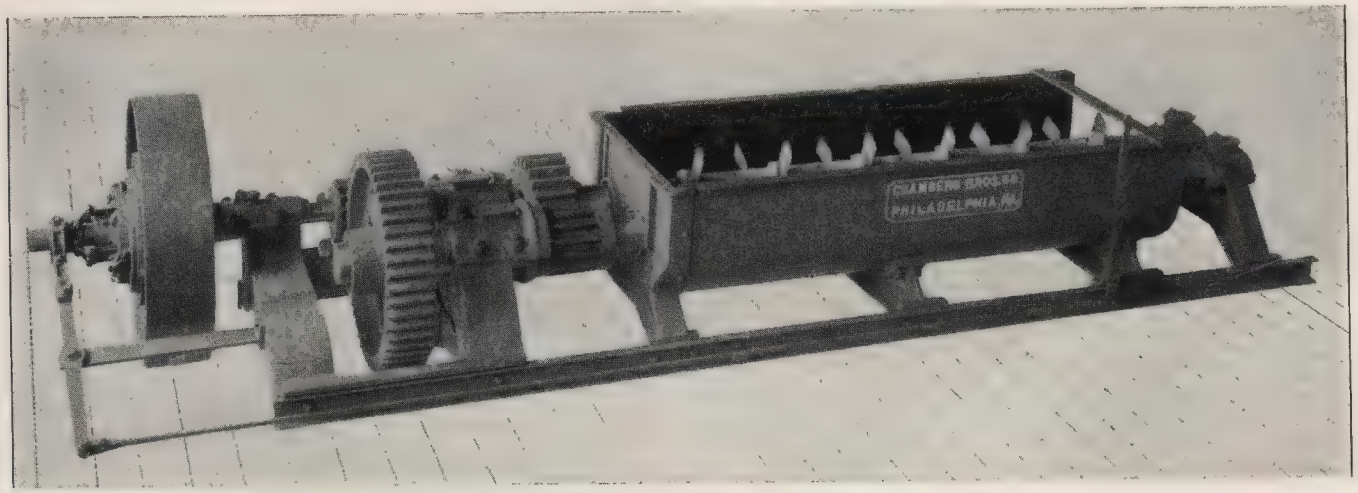


Discharge End of No. 1 Combined Mixing and Pugging Machine

The mixed and moistened mass of material is slowly and continuously fed forward to the enclosed portion of the pug chamber, where it is thoroughly pugged under pressure and discharged by means of a short, double-bitted hard auger through a circular opening, the size of which can be changed at will.

The entire machine is about 19 feet long. It is strong and heavily built, being mounted on channel-iron framing with the driving gear journaled in one solid casting and with all journals well protected from dirt and easily oiled. The driving and counter pinions are of steel, as are also the gears that drive the mixing shaft. The driving shaft is fitted with an outer bearing and with a bronze-bushed friction clutch pulley 48 inches diameter by 12-inch face.

Unboxed weight about 16,000 pounds.



The No. 6 Double-Shaft Horizontal Mixing and Pugging Machine

This mill is shown with open top, but is so designed that the top may be covered, say one-half or two-thirds of the distance back from the discharge end. It is a double-geared machine, with all bearings outside the tub and away from the material to be worked.

It has two 5-inch diameter shafts, carrying 48 steel knives—24 in each shaft—so secured that they can be set at any desired angle. The driving shaft is $2\frac{15}{16}$ inches diameter and is fitted with friction clutch pulley 36 inches diameter by 8½-inch face, with starting lever located at a convenient position for the attendant. The whole machine is on a framework of steel channels, and all the driving gear is journaled in one solid casting.

Width of frame 3 feet. Length, exclusive of driving pulley, 13 feet 6 inches.

From bottom of frame to top of tub 2 feet.

Weight, unboxed, about 5,500 pounds.

A speed of 140 revolutions per minute of driving pulley gives 40 revolutions per minute of pug shaft.

For mills of larger size, same style, see Nos. 11 and 12, page 57; Nos. 16 and 17, pages 58 and 59.

DOUBLE-SHAFT HORIZONTAL MIXING AND PUGGING MACHINE No. 11

A double-geared machine having two pug shafts each 4 inches square, carrying 26 knives in each shaft. Driving shaft $2\frac{15}{16}$ inches diameter. Friction clutch pulley 36 inches diameter by 8-inch face. Whole machine mounted in framework of 4-inch steel channels. Width of frame 3 feet. Length, exclusive of pulley, 16 feet 6 inches.

From bottom of frame to top of tub 24 inches.

Weight, unboxed, about 7,000 pounds.

DOUBLE-SHAFT HORIZONTAL MIXING AND PUGGING MACHINE No. 12

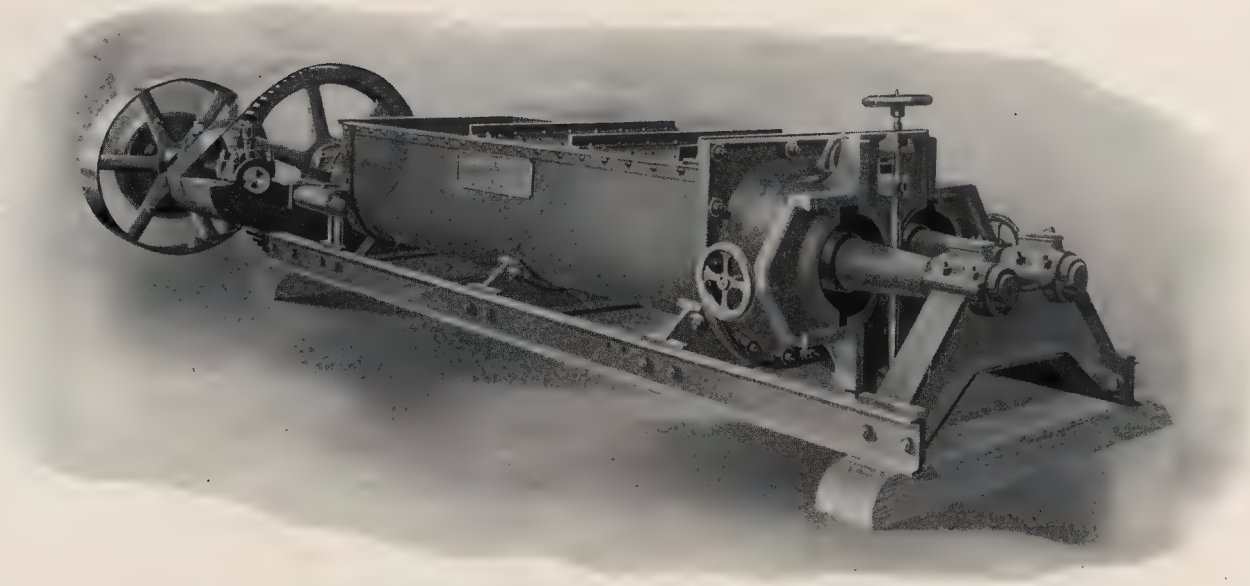
A double-geared machine having two cast-iron pug shafts, each 7 inches diameter, forged steel knives with blades 8 inches long, boiler-iron tub 10 feet long, driving shaft $2\frac{15}{16}$ inches diameter, friction clutch pulley 40 inches diameter by 10½-inch face, with No. 7 clutch. Machine mounted on a framework of 6-inch steel channels. Channel frame 4 feet 3 inches wide by 14 feet 10 inches long. Total length over all from outer end of driving shaft to end of channels at the discharge end of the machine, 20 feet. Height from bottom of channel frame to top of tub, 2 feet 8 inches. Diameter of main spur gear, 3 feet 9 inches. Weight of machine, unboxed, about 12,000 pounds. Capacity sufficient for No. 7 or No. 8 Brick Machine.

THE CHAMBERS DOUBLE-SHAFT HORIZONTAL GRANULATING AND FEEDING MILL No. 13

This mill has two 9-inch diameter pug shafts arranged in the same horizontal plane and geared together, each carrying 40 steel-faced pugging knives secured by keys and adjustable to any desired angle with the shaft.

Depending upon the work to be accomplished, the mill is built with an independent boiler-iron tub for each pug shaft (all arranged in one frame), or will be built with a single wide tub receiving both shafts, so located that the paths traveled by each set of pug knives intersect.

The object of the first-described construction may be illustrated as follows: Bricks were to be made from a mixture of two kinds of clay—one very strong, the other a weak clay. Under the method of receiving these clays at the machine house, a mixture in desired proportions could not readily be secured if left to the shovelers or feeders. Using our mill, the strong clay is dumped by the cartload into one tub, and the weak clay into the other, with little regard to proportions so long as each is supplied. The knives in the two pug shafts are each given a relative set representing the proportions desired. Both shafts making the same number of turns per minute, the mill discharges into a common receptacle a granulated mass of material made up of each kind of clay in exact proportions. This mill is very heavy and designed for hard work. It can be made to feed clay enough for 120,000 bricks per day.



Double-Shaft Mixing and Pugging Mill No. 16

The thorough mixture of two or more kinds of tough clay, shale with clays, or ground calcined material, requires more than the ordinary open-top pug mill having a free discharge. Our No. 16 mill has adjustable gated mouth-pieces at end of tub, with boiler iron plates partially covering the top of tub. By thus holding the material a thorough mix is secured, lumps reduced and a smooth, plastic mass discharged as wanted. The two 7½-inch diameter shafts carry a total of 57 knives, so secured as to be easily adjustable to any desired angle.

Machine has steel pinions, is mounted on a framework of 6-inch steel channels and has friction clutch pulley.

Unboxed weight 12,500 pounds.

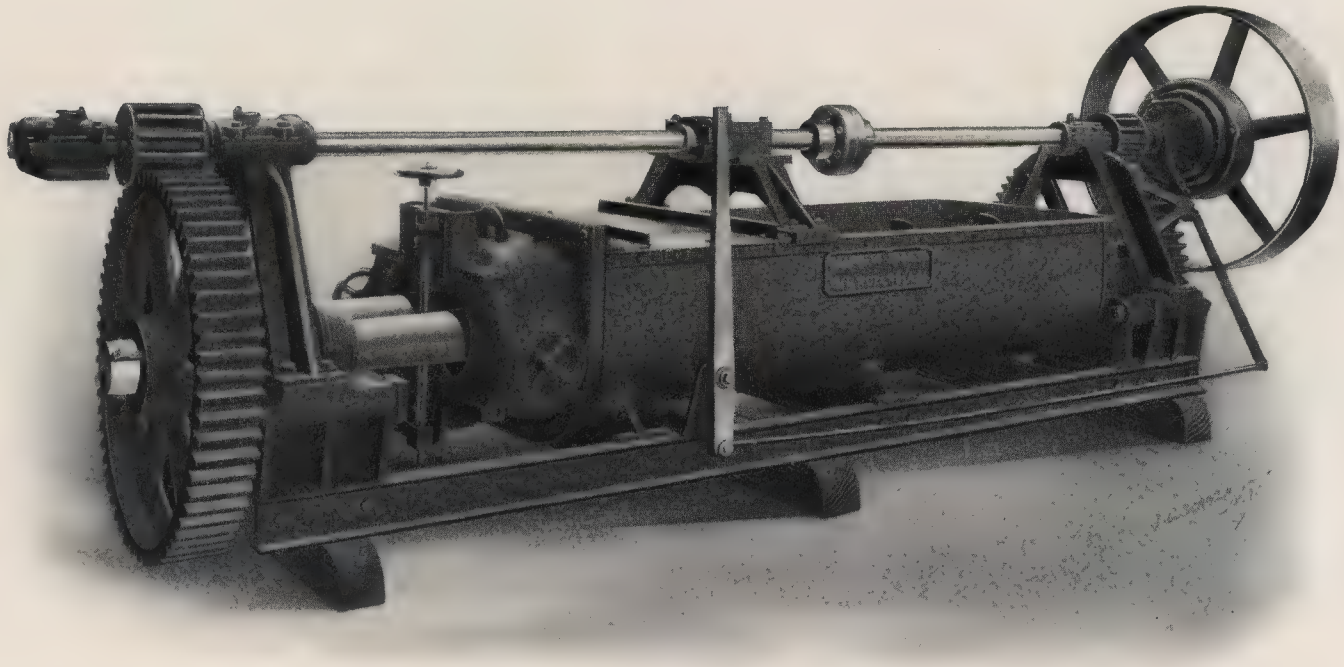
Total length of pugging cylinder 10 feet.

From outer edge of pulley to end of channel frame 18 feet 7 inches.

Width of channel frame 4 feet 5 inches.

Height from bottom of channels to top of tub 32 inches.

Friction clutch pulley 40 inches diameter by 12-inch face.

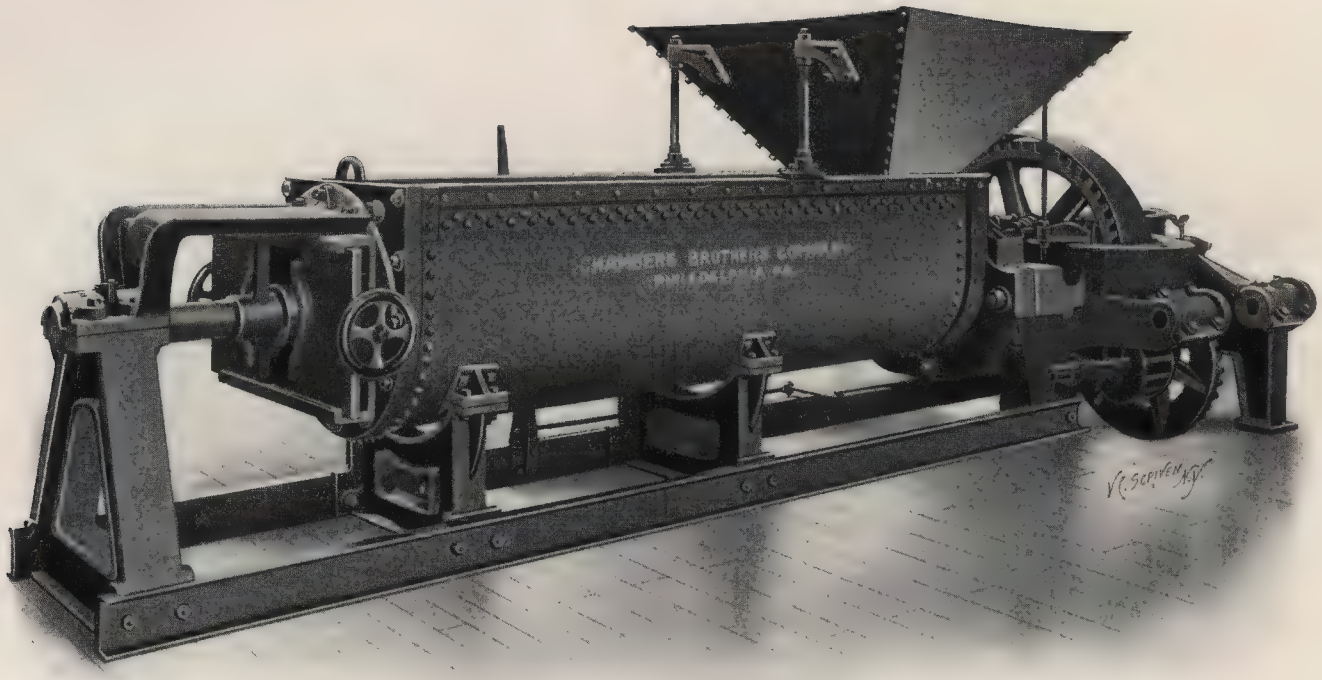


Double-Shaft Mixing and Pugging Mill No. 17

Similar to No. 16, but with overhead countershaft and independent spur-gear drive for each pug shaft applied at opposite ends of machine. Drawing 87-A-14.

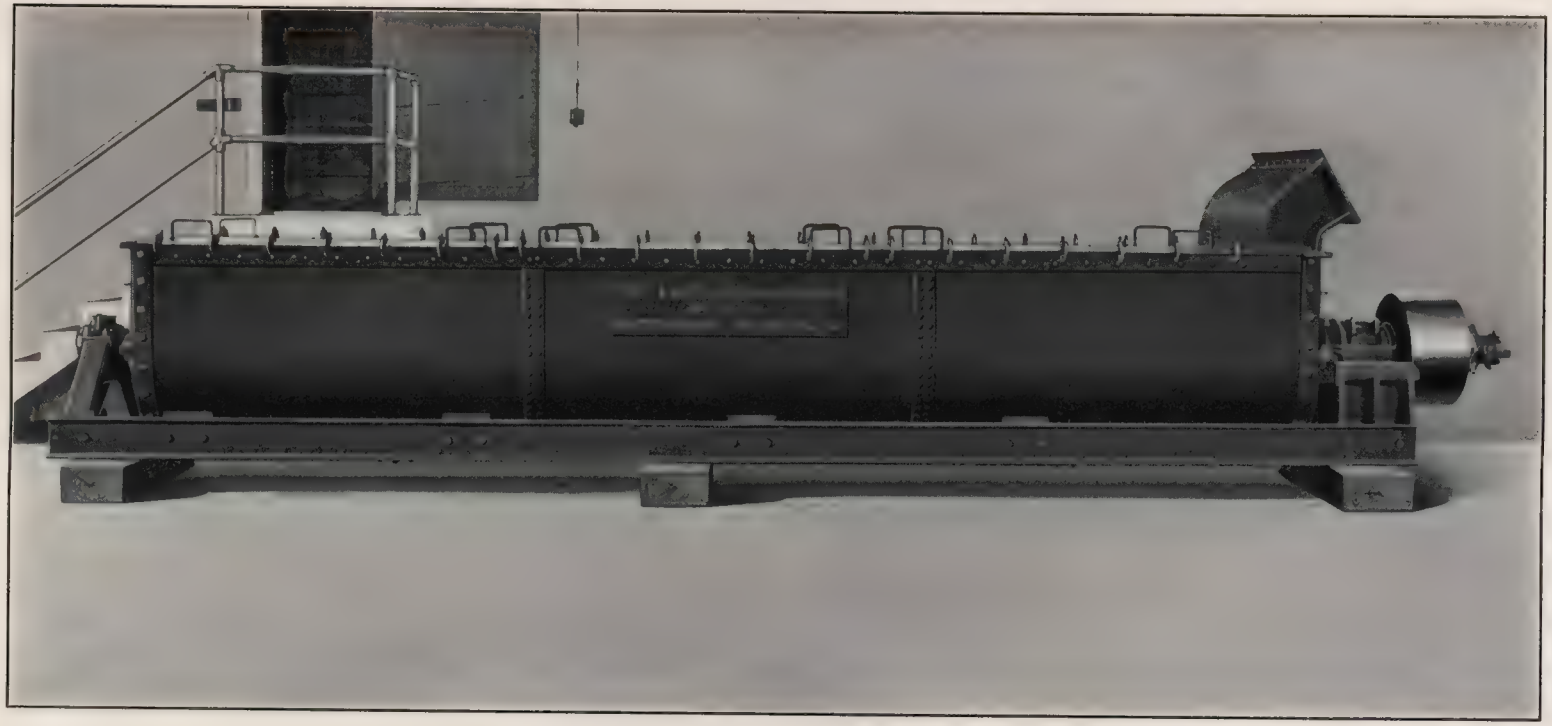
Weight about 16,500 pounds.

For severe work this method of drive is recommended in preference to that shown on Mill No. 16.



Water-Jacketed Heavy Mixer No. 1-B

This is a very strong machine, with water-jacketed tub designed to carry boiler pressure. The whole machine is mounted in framework of steel channels with iron cross rails. Driving gear is journaled in the frame used for our No. 7 Brick Machine. This mixer may be built either spur or bevel geared. It has friction clutch pulley 48 inches diameter, forged steel pug shaft carrying 37 knives adjustably secured. Length over all about 19 feet 6 inches. Tub alone about 10 feet long by 30 inches wide. Height, including flared hopper, 5 feet 10 inches. Unboxed weight about 16,500 pounds. The top of tub may be covered with steel plates and the discharge end fitted with taper case having adjustable gated mouthpieces.



The C. A. Wentworth Washing Machine

Drawing No. 103-B-58. Weight about 20,000 pounds.

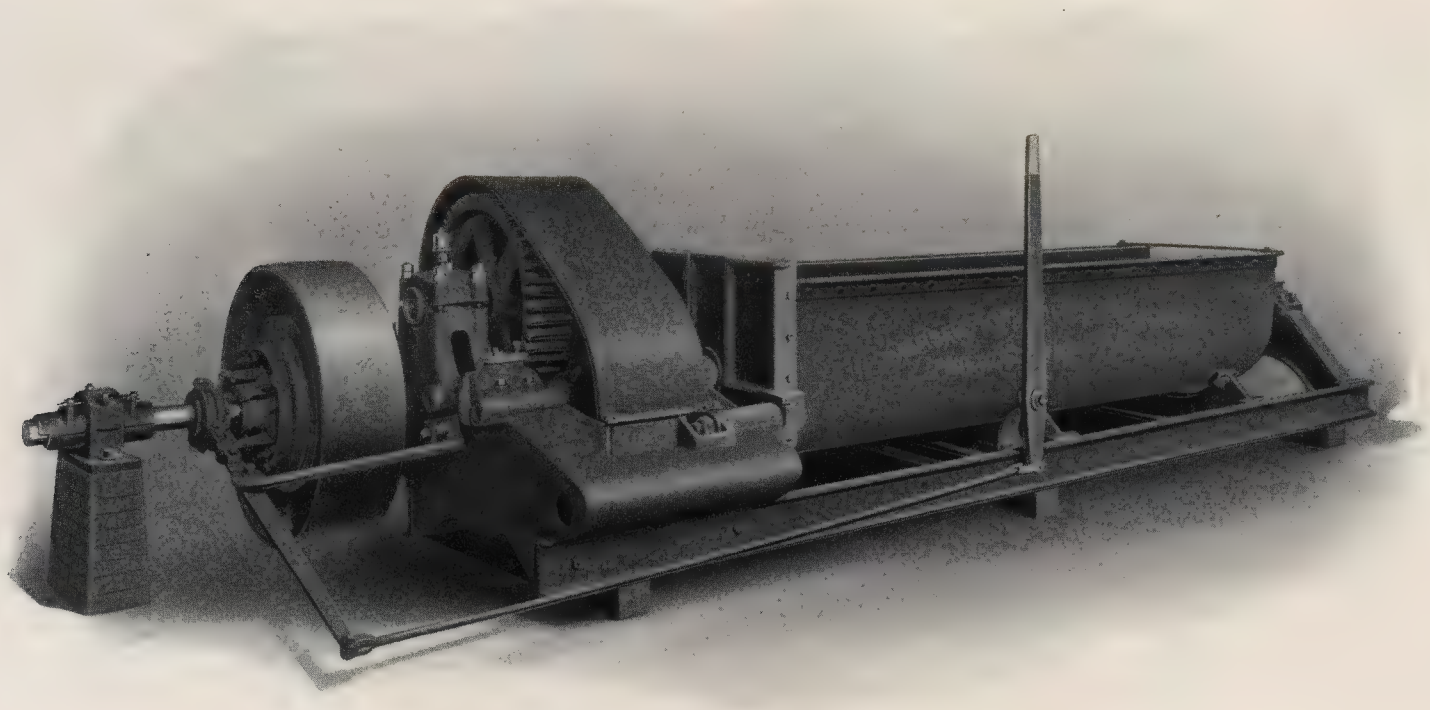
This machine, designed by an experienced mining engineer, is used for separating argillaceous materials from gravel, crushed rock, ores or similar materials of heavy specific gravity. The boiler-steel tub is 20 feet long by 3 feet 6 inches wide and covered with steel plates secured by clamps and of convenient widths for removal. Main blade shaft is 10 inches diameter and fitted with 47 blades of special design.

Friction clutch pulley 24 inches diameter by 12½-inch face with No. 6 clutch applied to main blade shaft. No gearing used.

Main frame of 8-inch steel channels. Height from bottom of channels to top of tub is 3 feet 7 inches

Main journal bearing provided for water lubrication.

With shaft making 140 R. P. M., this washer treats from 50 to 75 cubic yards of earth and crushed rock per hour.



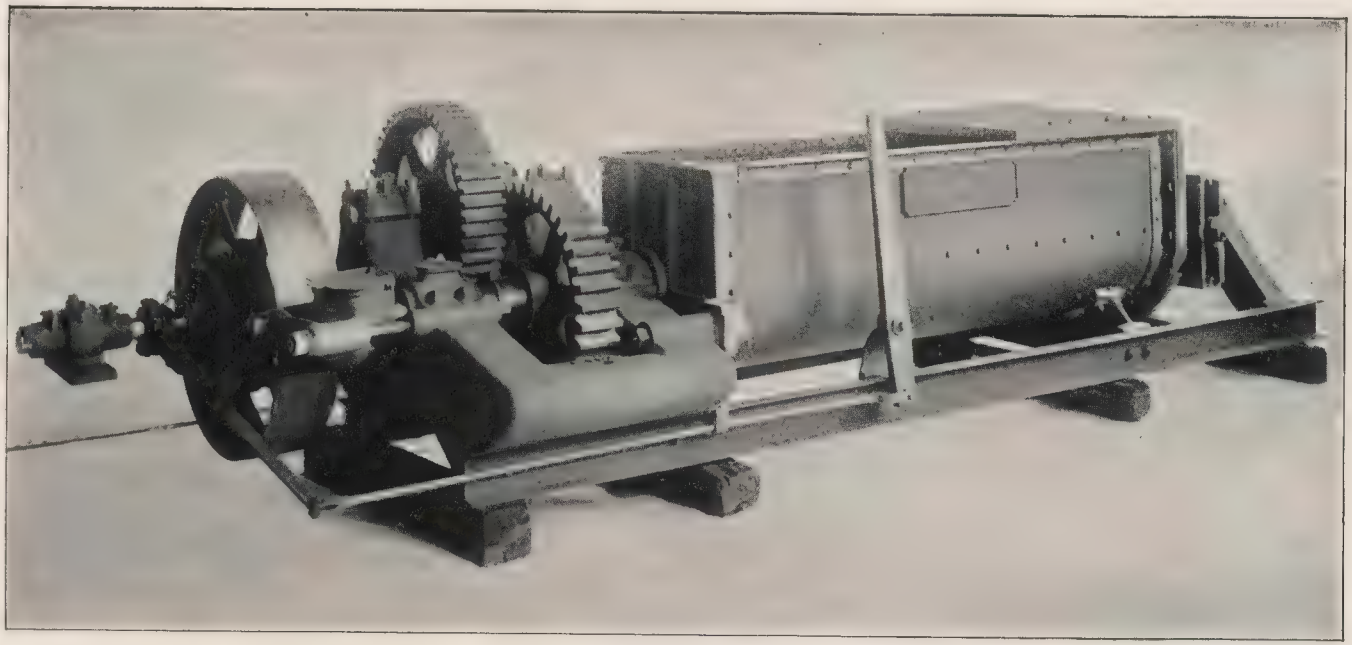
No. 2-B—Single-Shaft Pug Mill

This mill is geared the same as No. 2, page 63, but has an open-end tub. When made with tub 10 feet long, cast-iron pug shaft 7 inches diameter and carrying 40 forged steel knives is used.

Unboxed weight about 8,500 pounds.

This same mill may be built with tub 12 feet long, using a forged steel shaft carrying 48 knives. In this event heavier clutch pulley is used, providing increased belt surface.

Unboxed weight about 9,200 pounds.



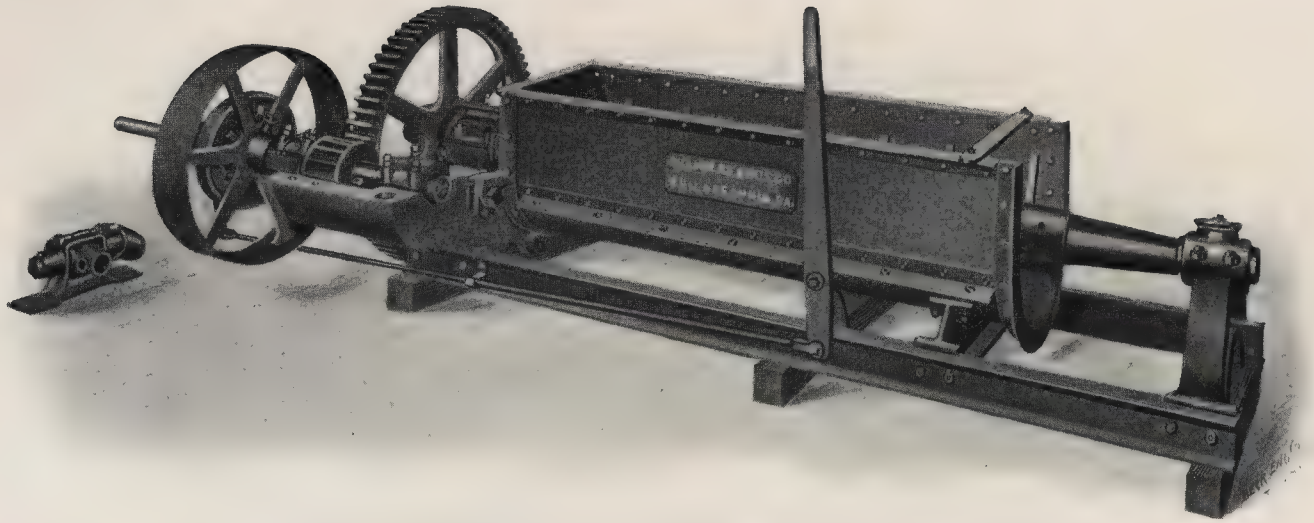
The No. 2 Single-Shaft Pug Mill

This is a strong, single-shaft horizontal pug mill, pugging clay under pressure and discharging by means of a short, double-bitted, hard iron auger through a circular opening, which can be made smaller or larger at will. It has a pug shaft 6 inches in diameter, with forged steel-faced knives so secured to the shaft that they can be set at any desired angle.

The whole machine is about 14 feet long, and is mounted on channel frame with the journal bearings of driving gear all in one solid casting. The driving and counter pinions are of steel.

The machine has bronze-bushed friction clutch driving pulley 36 inches in diameter by 8-inch face, and is designed and guaranteed for heavy work.

Unboxed weight about 8,500 pounds.



The Chambers No. 3 All-Iron Single-Shaft Pug Mill

This is an open-top horizontal pug mill having 6-inch diameter pug shaft and pugging knives so secured to the shaft that they can be set at any desired angle.

It has single gear of large diameter with shrouded driving pinion and is fitted with friction clutch driving pulley 36 inches diameter by 8½-inch face. Speed of pulley, 162 revolutions per minute for 30 turns of pug shaft per minute.

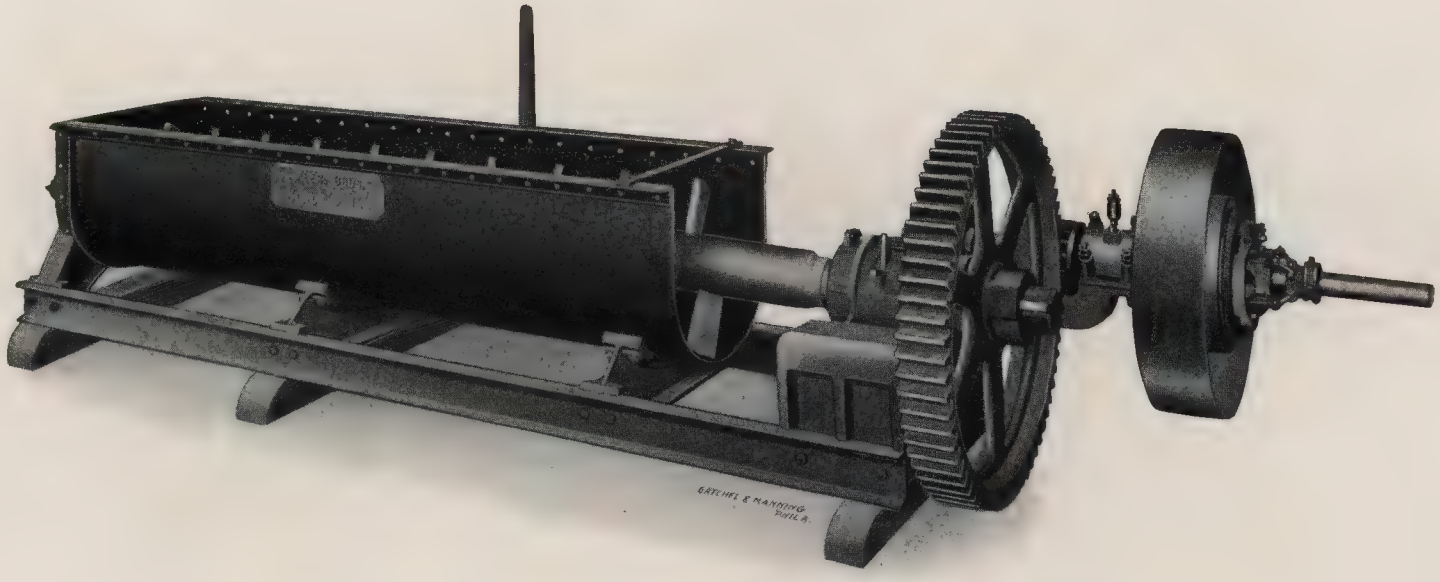
The journal bearings are in one solid casting, and the whole machine is mounted on steel channel frame with iron cross rails.

No. 3 Reversed Mill

This mill is also made with tubs reversed, so as to discharge the clay towards the gear-end of the machine.

Tub 7 feet 4 inches long.

Net weight 4,800 pounds.



No. 8 Spur Gear Pug Mill

This mill is made with tub 10 feet long. It is strong and substantial, but presents great simplicity of construction. Placing the gears where shown removes them from the point at which clay is fed into the mill. All journal bearings are entirely outside the clay tub. The 10-foot length carries 40 forged steel knives so secured that they can be set at any desired angle with the shaft. This feature regulates the feed, secures a uniform output, and with those who know is a plan much appreciated. An adjustable ball-and-socket bearing for supporting end of driving shaft is furnished.

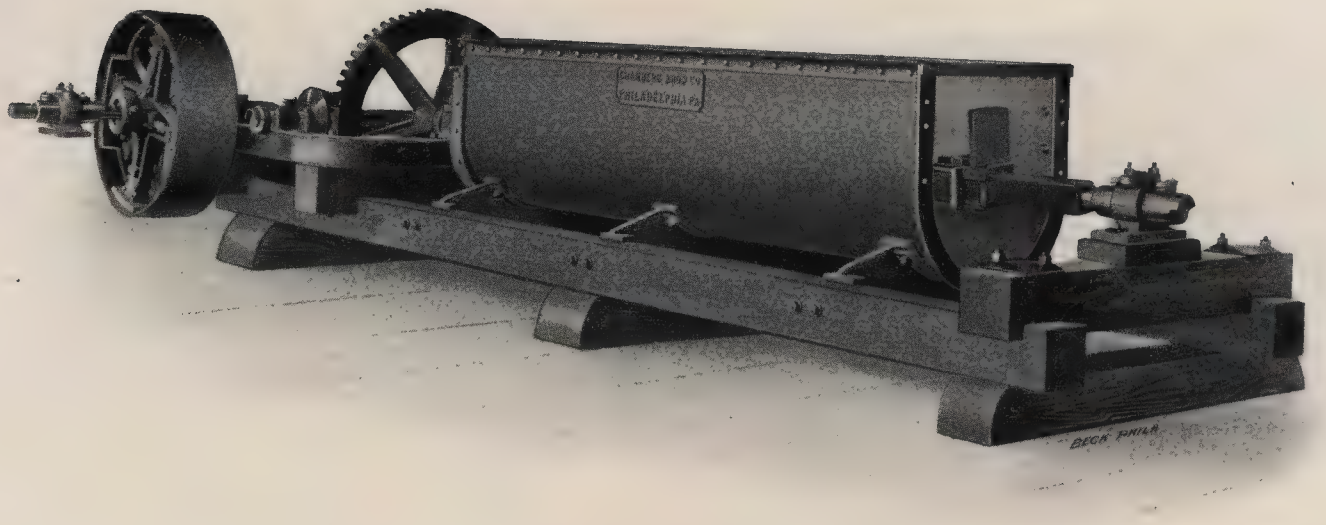
Weight unboxed about 7,500 pounds.

Length from outer edge of driving pulley to rear end of tub, 15 feet 2 inches.

Width of steel channel frame, 3 feet.

Height from bottom of steel channels to top of tub, 2 feet 8 inches

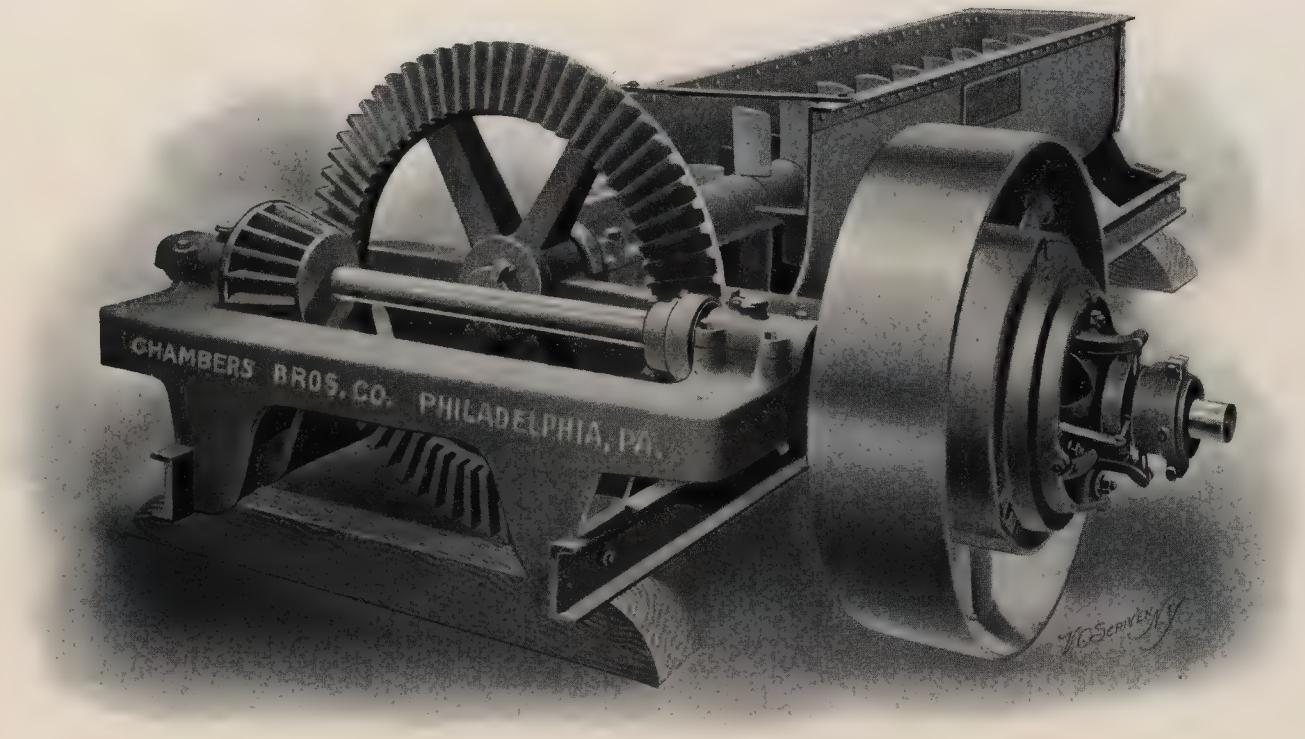
Outside diameter of main gear, 3 feet 10 inches.



The Chambers No. 7 Extra Heavy Beveled-Geared Mill

Has friction clutch pulley on driving shaft $2\frac{15}{16}$ inches diameter. Boiler-iron tub 10 feet long. Main frame 18 feet long by 5 feet wide. Pug shaft of 4-inch square steel. All gearing journaled in solid frame casting. This machine may be used in horizontal position or with front end elevated. Designed for concrete and cement mixtures—contractors' work. For making stiff clay puddle for reservoir beds. Can be built with compound gear if required.

Weight about 8,800 pounds.



No. 7 B—Bevel-Geared Pug Mill

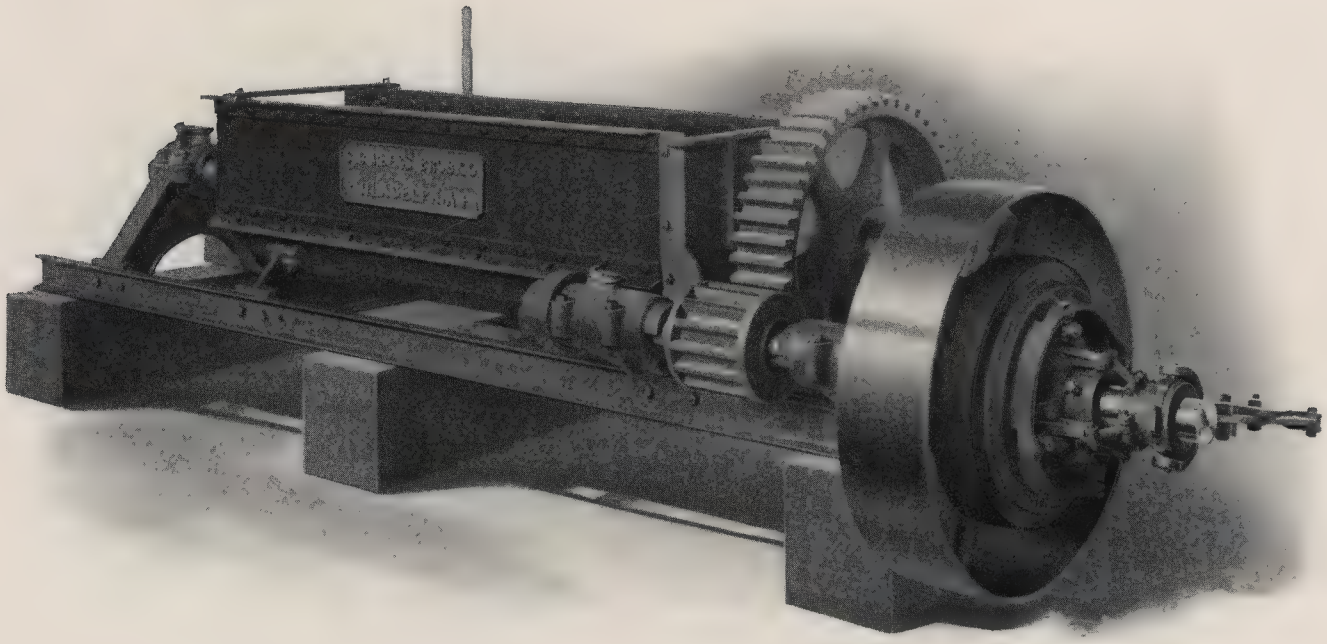
Has large-diameter bevel gear of semi-steel, with double shrouded pinion. Driving shaft $2\frac{15}{16}$ inches diameter. Friction clutch pulley 40 inches diameter by 12-inch face. Pug shaft 7 inches diameter with adjustable forged steel knives. Iron gear frame mounted on 6-inch steel channels. Tub made 7 feet 3 inches, 10 feet or 12 feet long with corresponding number of knives as ordered.

Unboxed weighs about 7,200, 7,600 and 8,000 pounds, respectively.

Bevel Gear Mill No. 29 B

Drawing No. 95-C-28. A very heavy bevel-geared mill of pulling pattern, built on framework of long 6 x 6-inch steel angles for special installation. Tub 28 inches diameter by 12 feet long. Steel pug shaft with 48 knives. Clutch pulley 48 x 12 inches with No. 7 clutch.

Unboxed weight about 9,500 pounds.

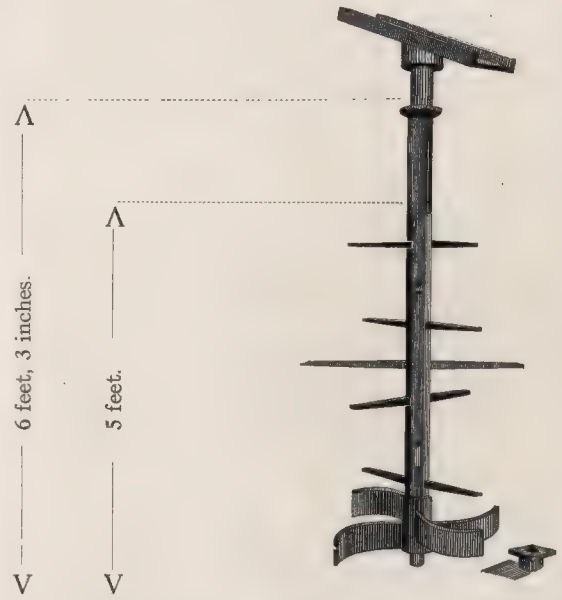


The Chambers No. 4 All-Iron Single-Shaft Pug Mill

This is an open-top horizontal mill, having 5-inch diameter pug shaft and 30 steel pugging knives, so secured to shaft that they can be set at any desired angle. It has single gear and pinion of strong, heavy design. The driving shaft is $2\frac{15}{16}$ inches diameter, and is fitted with friction clutch pulley 30 inches diameter by $7\frac{1}{2}$-inch face, supplied with starting lever. The whole machine is mounted on framework of steel channels, and all bearings are entirely out of the dirt and well protected. Usual speed of driving pulley, 180 revolutions per minute.

Weight unboxed about 3,100 pounds.

PUG-MILL SHAFT FOR HORSE-POWER

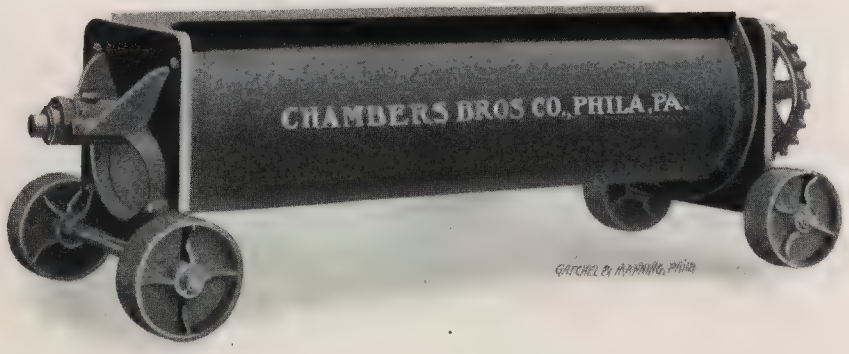


FOR MIXING AND GRINDING CLAY FOR HAND MOLDING.

This appliance consists of pug shaft 4 inches in diameter, with sweep-block, collar, knives, mud wipers and bottom step-plate. Total weight about 500 pounds. There are four wipers 6 inches wide and of 3-feet diameter. Height from bottom of wipers to bottom of sweep-block is 6 feet 3 inches.

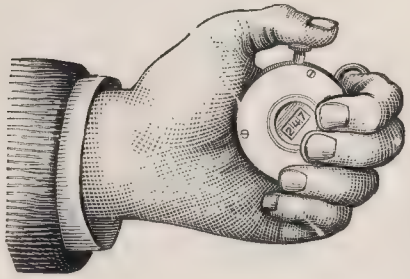
The complete frame and box will be furnished in connection with this shaft when desired.

PORTABLE MIXER No. 9



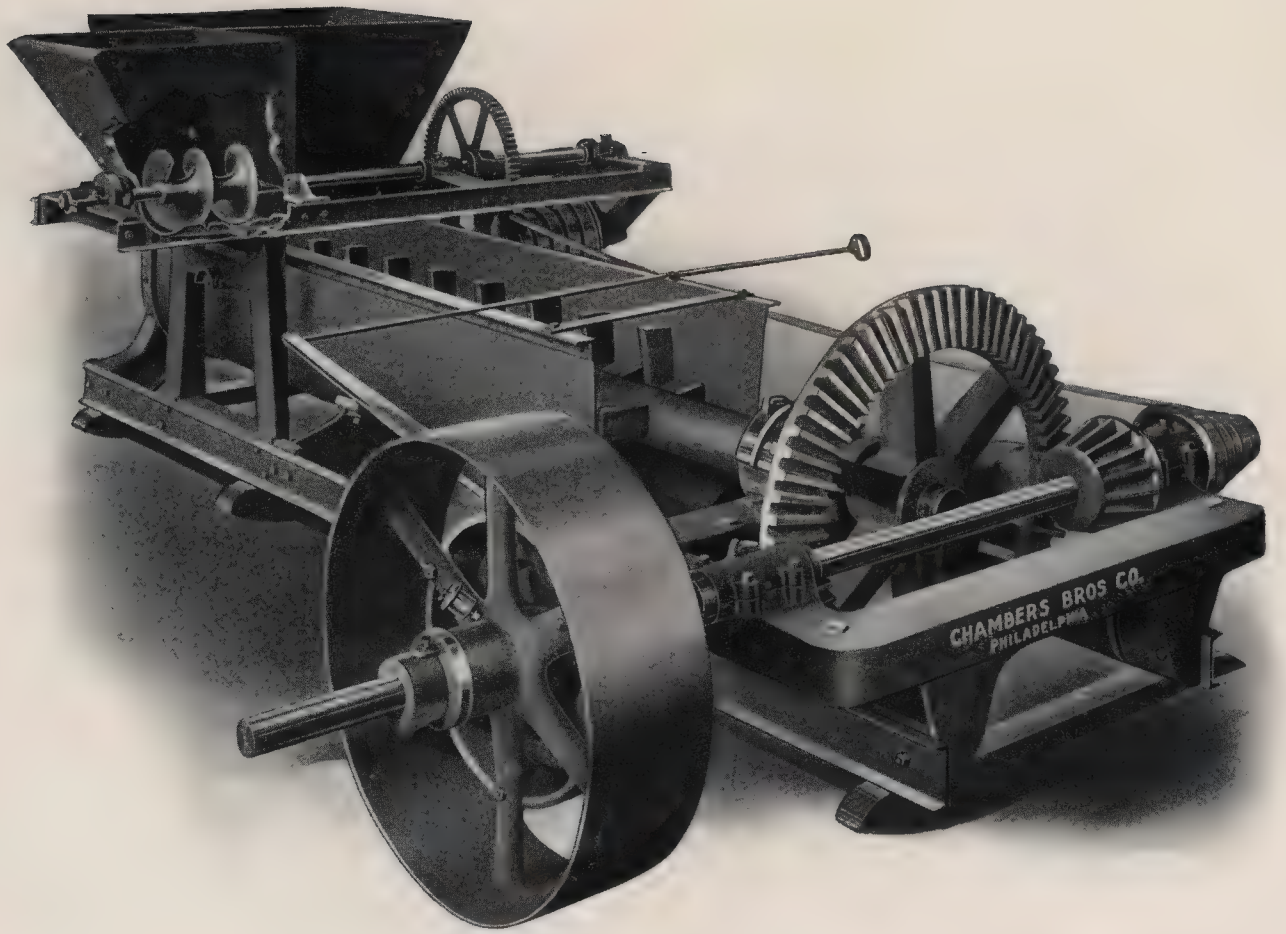
The illustration shows a sprocket wheel for chain belting as the means of driving, but if customer prefers we furnish plain belt pulley. The machine is mounted upon broad tread wheels to facilitate change of position. The tub is of boiler iron 7 feet 9 inches long by 25 inches diameter. Steel mixing shaft is 3 inches square and the journal bearings are in halves, babbitted and located entirely outside the tub and away from contact with the dirt and grit. The mixing paddles are forged. The wheels are 14 inches diameter by 6-inch tread and the distance from centre to centre of axles is 8 feet 2 inches.

TALLY REGISTER



This little register tallies from 1 to 1,000, and can be set to zero at will. It is simple in construction, can be carried in the pocket, is about the size of an ordinary watch and weighs about 6 ounces. Some brick manufacturers use it for recording the number of carloads or barrowloads of bricks made per day, also for recording the carloads or cartloads of clay hauled.

The above cut shows the position in which the Tally Register is held in use.



No. O Clay and Sand Mixing Mill

For mixing sand or coal dust with clay and delivering a pugged mass of material. Proportions varied by shifting belt to different cones. Knives in main shaft are adjustable.

Unboxed weight about 9,200 pounds.
Drawing 88-C-128.

Memorandum of Pug Mills Not Illustrated

We have drawings and patterns for various mills not illustrated but which have been built to meet different conditions.

Catalogue No. 24. Drawing 90-C-40. Pushing Mill, tub 24 inches diameter, 14 feet 9 inches long. Steel shaft with 59 knives.

Catalogue No. 25. Drawing 90-C-43. Pulling Mill, or reverse of No. 24. Same dimensions.

Catalogue No. 26. Pushing Mill, drawing 90-C-78, 28 inches diameter, tub 14 feet 9 inches long. Steel shaft with 59 knives.

Catalogue No. 27. Pulling Mill, drawing No. 96-C-6. The reverse of No. 26 mill. Same dimensions. Built with cut gears when for heavy work. Unboxed weight about 11,100 pounds.

Catalogue No. 28. A counter-geared mill, pushing pattern. Tub 28 inches diameter, 14 feet 9 inches long. Pug shaft 7 inches diameter of forged steel with 59 knives.

Catalogue No. 29. A very heavy counter-geared mill of pulling pattern. Drawing No. 88-B-129. Tub 28 inches diameter, 14 feet 9 inches long. Pug shaft 7 inches diameter with 59 knives. This mill is provided with three bearings on the pug shaft and also on counter-shaft. The driving shaft has the usual outboard journal bearing beyond clutch pulley.

Catalogue No. 29 B. Heavy bevel gear mill of pulling pattern. Drawing No. 95-C-28.

Clay-Grinding Machinery, Stone Extractors and Clay Crushers

DRY PANS

For grinding shales, such as are generally used in the manufacture of street-paving bricks, and, in fact, all ordinary brick clays when dried sufficiently to pass through a screen, the Dry-Pan is probably the most successful machine in use.

It not only grinds, but also screens, the coarser particles being thrown back under the rolls for regrinding until made fine enough to pass the screen-plates which comprise a portion of the pan bottom.

DISINTEGRATORS—STANDARD PATTERN

For the preparation of plastic clays carrying the moisture usually found in freshly dug surface clays our Standard Pattern Clay Disintegrators are very popular.

We build several sizes suitable for capacities ranging from about 2,500 to 10,000 bricks per hour.

One roller is driven at high speed, say 600 to 700 revolutions per minute, while the other acts merely as a feed-roll, and makes from 50 to 100 turns per minute. The essential feature, consisting of one or more continuous steel bars projecting slightly beyond the face of the fast-running roll, not only insures a chipping action against lumps of strong, tough clays, but upon striking a stone causes it to be thrown out, as by centrifugal force, upon the opposite side of the feed-hopper from which the material is being fed. Stones weighing as much as seven pounds and smaller to the size of one-half inch in diameter have been thrown out by our Disintegrators. Small pebbles are crushed and ground up with the clay.

KEYSTONE DOUBLE DISINTEGRATORS

In this machine both rollers are of equal diameter and both fitted with projecting steel bars, and both are driven at high speed.

Beneath these rolls is a hard metal block against the surfaces of which the rollers accomplish the fine grinding.

Because of the principles involved in its construction and operation this machine requires from 50 to 100 per cent. more power than a standard pattern Disintegrator of equal capacity.

It is likewise a more expensive machine to maintain in efficient condition. It will not discharge stone so freely as a Standard Pattern Disintegrator.

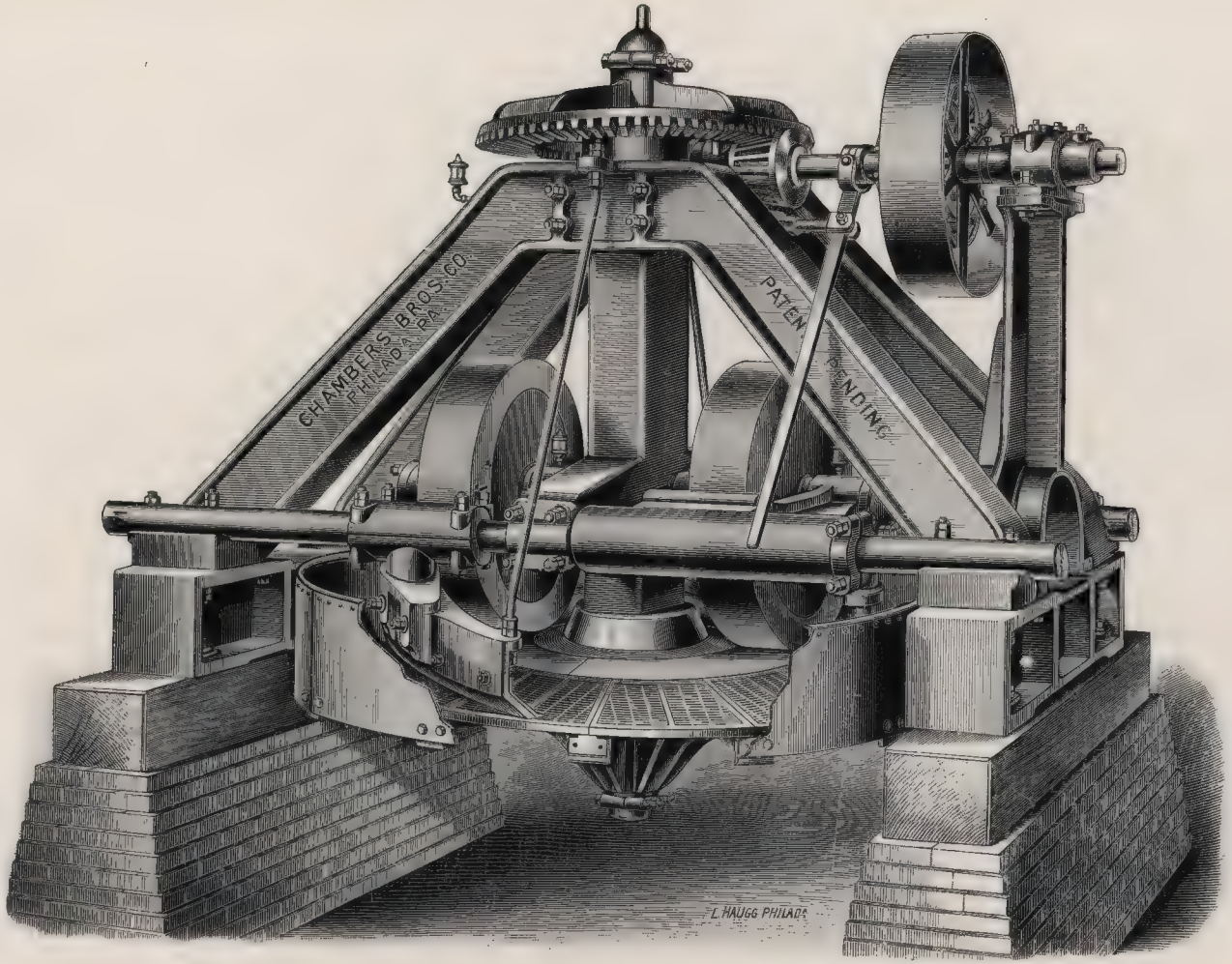
We do not recommend its purchase for ordinary conditions, nor unless customer will assume full responsibility for power and maintenance requirements.

Notwithstanding this there are some conditions under which the KEYSTONE DOUBLE DISINTEGRATOR appears to be the only grinder to accomplish desired results. We have developed three sizes: Nos. 25, 30 and 36.

ROLL CRUSHERS

We build various sizes of two-roll crushers, some of which have plain faces and others are fitted with removable threaded shells for discharging stones while crushing the lumps of clay.

These are most excellent machines as preliminary grinders, and are often used to prepare material for subsequent fine grinding operations.



Seven and One-Half Feet Diameter Self-Contained Dry Pan No. 3

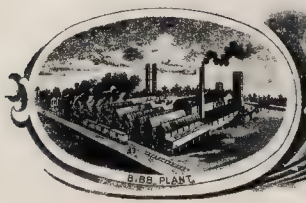
No Underneath Step Bearing—No Central Pier for its Support.

The grinding-rolls are held in independent arms, so that the position of one does not affect the other, and both have heavy hard-iron tires. They are 40 inches diameter by 8 inches face, secured to their shafts by feathers, and are journaled in bearings having renewable sleeves.

The main shaft-bearings of the central post are oiled by an overflow from the step-bearing above as well as independently.

This pan weighs about 25,000 pounds. It is fitted with friction-clutch pulley 36 inches diameter by 8 inches face. The grinding-plates are 2½ inches thick and made with babbitted pockets upon the under side, which insure their setting perfectly true and level. The scrapers can thus be run close to the pan bottom. The heavy iron curb has an angle-iron rim riveted to its upper edge, which strengthens it and prevents overflow of fine material

W. J. MASSEE, President D. J. MASSEE, Jr., V. Pres't. & Treas JAS. L. ANDERSON, Secretary. W. W. MOSLEY, Supt



THE BIBB BRICK COMPANY

INCORPORATED.

DAILY CAPACITY 200,000.

PHONE 194.

Macon, Ga.

JUNE 1, 1911.

The Chambers Bros. Company, Philadelphia, Penna.:

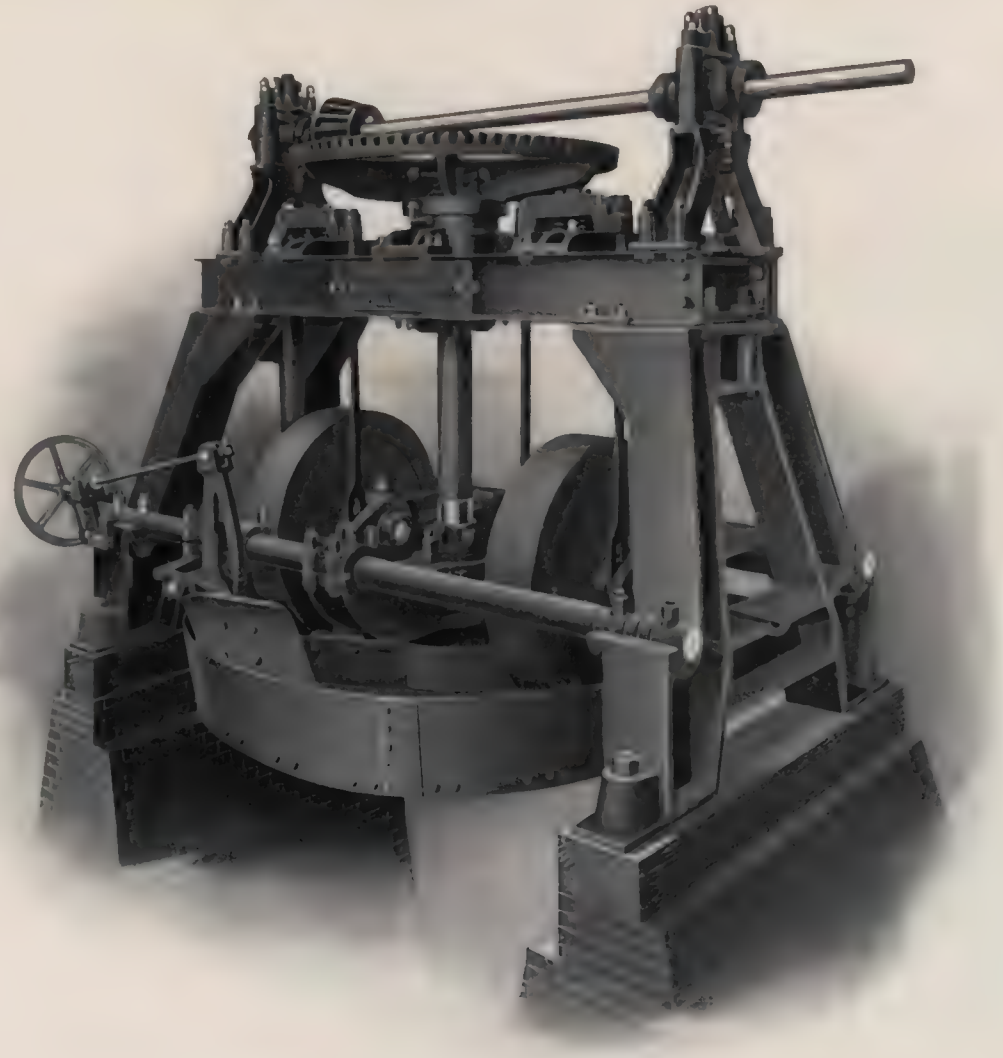
GENTLEMEN:—We are sending you under separate cover to-day an order for four Wet Pans for the Bibb Sewer Pipe Company. As you know, the controlling interest in this company is owned by the Bibb Brick Company. * * *

My eleven years' experience with the Chambers Brick Machinery was the cause of my giving you this order at an advanced price. * * * This is after many years, and making over fifty millions of brick per year with your make of machinery.

It is a pleasure to us to do this business with your company.

Yours truly,

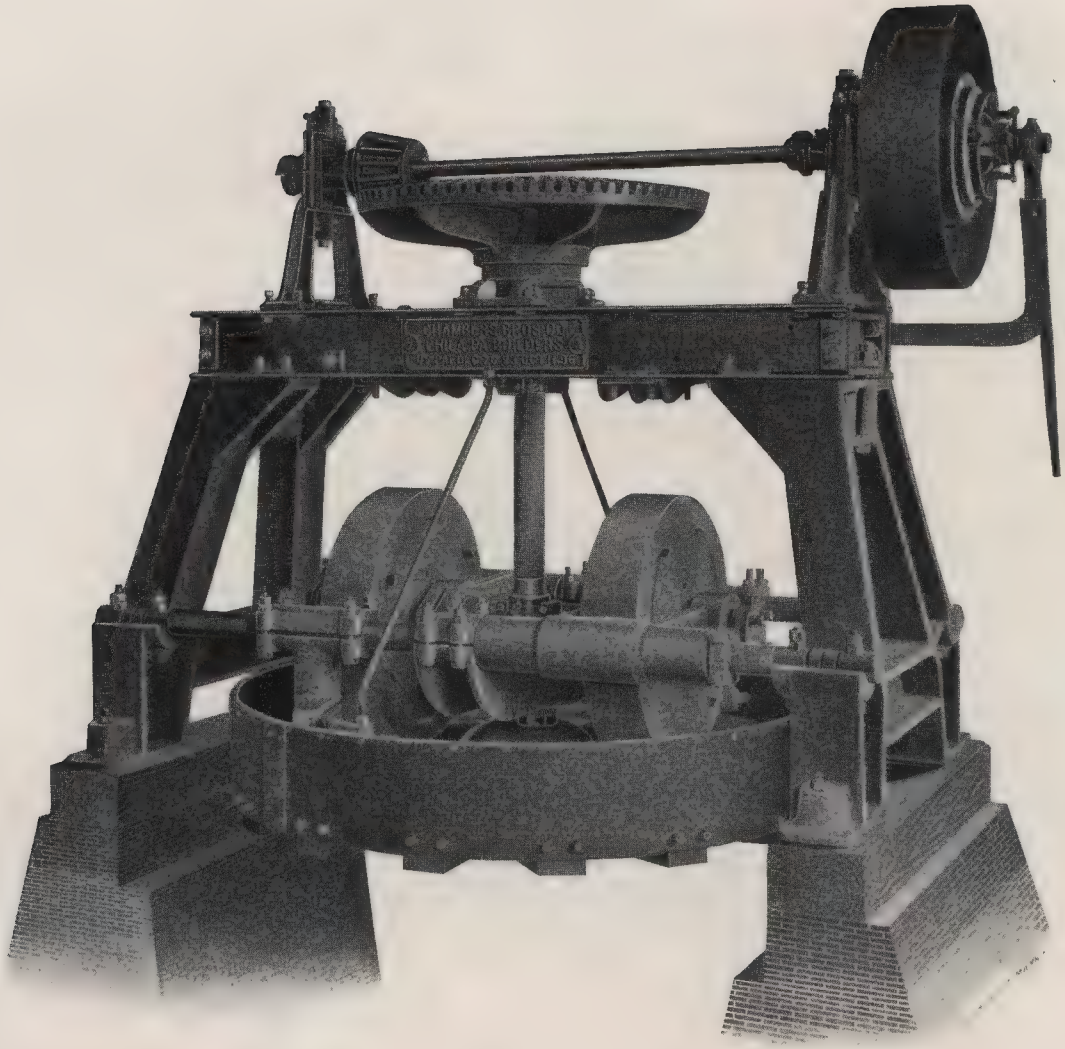
(Signed) W. J. MASSEE.



Eight Feet Diameter Suspended Wet Pan

Weight about 42,000 pounds.

Open frame construction. Overhead step-bearings. Suspension rods and springs for grinding rollers all on the same plan as our No. 2 Dry Pan. Vertical and driving shafts are both of increased diameter. Unloading plow is operated by hand wheel, bringing this feature under the safe control of the operator.



Suspended Nine-Feet Diameter Pan No. 2
Weight about 40,000 pounds.

THE SUSPENDED PAN

We have built this design for several years with much satisfaction to our customers.

It has no underneath step bearing and requires no central pier for support. Sweeps or wipers are eliminated, as the ground material can be hoppered to conveyor belt or to the elevator boot.

The grinding rollers are provided with suspension rods and springs, as shown on the machine illustrated on page 75.

For detailed weights and measurements see page 77.

Suspended Nine-Feet Diameter Pan No. 2

The main bearing suspending the pan is in the cross-head, made of steel I beams, entirely removed from the dirt and in a position easy of access. The vertical pan shaft is provided with adjustable babbitted bearings, and those of the driving shaft are also provided with vertical adjustment, which is especially valuable since it enables the gears to be always in proper mesh. The grinding-rolls are held in independent arms, are 48 inches in diameter and provided with hard iron renewable tires. The design of the frame constitutes a double truss, with steel members top and bottom, and the entire elimination of the underneath step-bearing is an improvement much appreciated by experienced users. This machine has adjustable steel toe and edge pieces on the plows, and has malleable iron screen plates.

The machine is so arranged that the weight of the crushing rolls may be carried upon heavy springs when the pan is empty or nearly so, and yet have their full weight upon the material when grinding. This avoids the unnecessary wear from having rollers run against pan bottom when empty. Independent adjustment of these springs is provided both for tension and for distance they will hold rollers above pan bottom.

The plows have the proper curve to sweep material under the grinding rolls with least resistance, and are firmly secured and provided with adjustments for wear and position. Plows have renewable steel wearing strips, reversible steel toe-pieces with independent adjustments.

DIMENSION DATA

The weight of each roller with its arm and short shaft is 6,000 pounds, making 12,000 pounds for the two.

The MAIN HUB or DISK casting of the pan weighs 3,300 pounds.

TIRES on grinding-rolls are of hard white iron 10 inches face by 5 inches thick.

VERTICAL SHAFT is of steel 6 inches diameter.

DRIVING SHAFT is $3\frac{7}{16}$ inches diameter and is provided with vertical adjustment.

CROWN GEAR is 65 inches diameter, 7 inches face, $2\frac{3}{4}$ inches pitch.

SCREEN PLATES are of malleable iron, making them strong and securing greatest possible screening surface without sacrificing strength.

SIDE FRAMES each weigh 3,000 pounds.

CROSS-HEAD is composed of two heavy section 12-inch steel I beams placed side by side on 26-inch centre measurement. These carry the weight of the running parts of the pan.

FRICTION CLUTCH PULLEY is 40 inches diameter, 12½-inch face, of our flexible disk pattern. Speed of 187 R. P. M. produces 38 turns per minute of the pan. With shale in favorable condition this pan is grinding from 7 to 8 cubic yards of material per hour, with a consumption of about 25 to 30 horse power.

SIBLEY-MENGE PRESS BRICK CO.

BIRMINGHAM, ALA.

Chambers Bros. Company., Philadelphia, Pa.:

GENTLEMEN:—When you ship the pan, please also send us one set of malleable iron screens for our large 9-foot pan with openings 3/16 inch wide, same as originally furnished with that pan. The original set are still in good shape, but the openings have worn a little too coarse. This pan has been in constant use for sixteen months and we have not had to spend one cent on it in repairs, as you know.

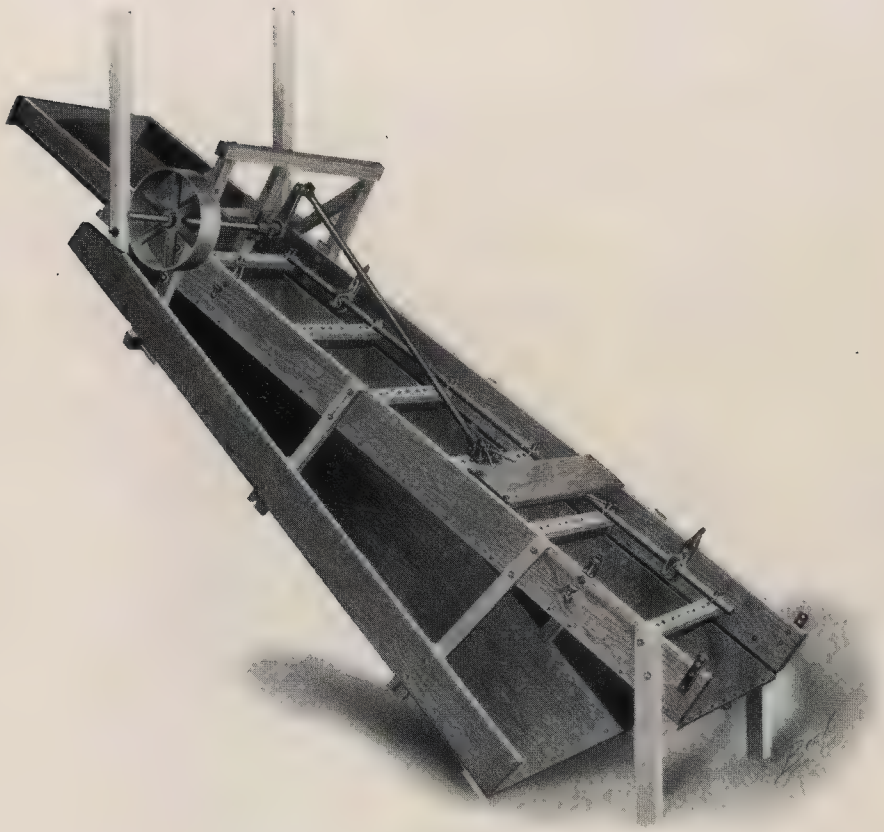
We are grinding both shale and fire clay. The absence of the troublesome step found with other pans has relieved us of one of the burdens that is most vexatious and costly to clay workers.

With best wishes.

Yours very truly,

SIBLEY-MENGE PRESS BRICK CO.,

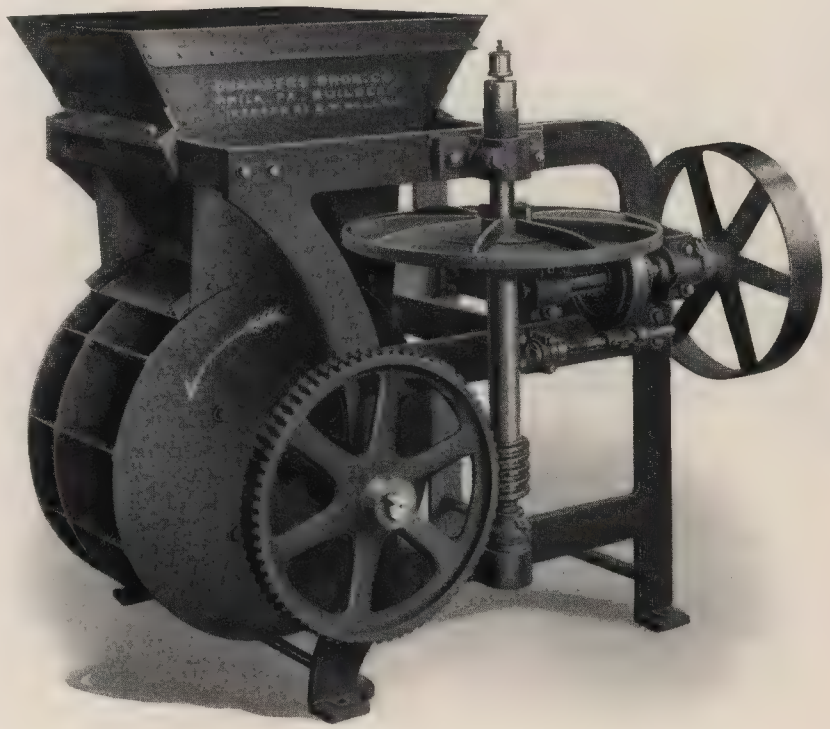
Per JNO. W. SIBLEY, *President.*



The H. G. Virgin Clay Screen

Unboxed weight about 2,000 pounds.
Driving pulley 24 x 6½ inches.
Normal speed 30 R. P. M.

The actual screening surface, 16 feet long by 4 feet wide, is over perforated steel plates. Six sets of steel wire brushes are mounted upon a reciprocating frame actuated by crank and rod. The brush frame is adjustable for height, so that ends of wire brushes may just clear the screening surface. The mechanism is simple and good results are obtained.



The Keystone Measuring and Feeding Machine

No. 72-D-24. Built under License Agreement with B. W. Ballou.

THE KEYSTONE

Measuring and Feeding Machine

This machine in somewhat different form has been used several years on a face brick works with great satisfaction. Under license agreement with the original inventor, we have remodeled the machine, making it self-contained and introducing convenient means for varying the speed of the bucket wheel without change of pulley speed. This variation can be effected whilst machine is in motion, thus making it possible to feed the quantity of material found desirable after the machinery to be supplied has been put into actual operation.

By changes in construction of the hopper and of the bucket wheel, machines are built to feed one, two, three or four ingredients.

Floor space 6 feet by 4 feet 9 inches.

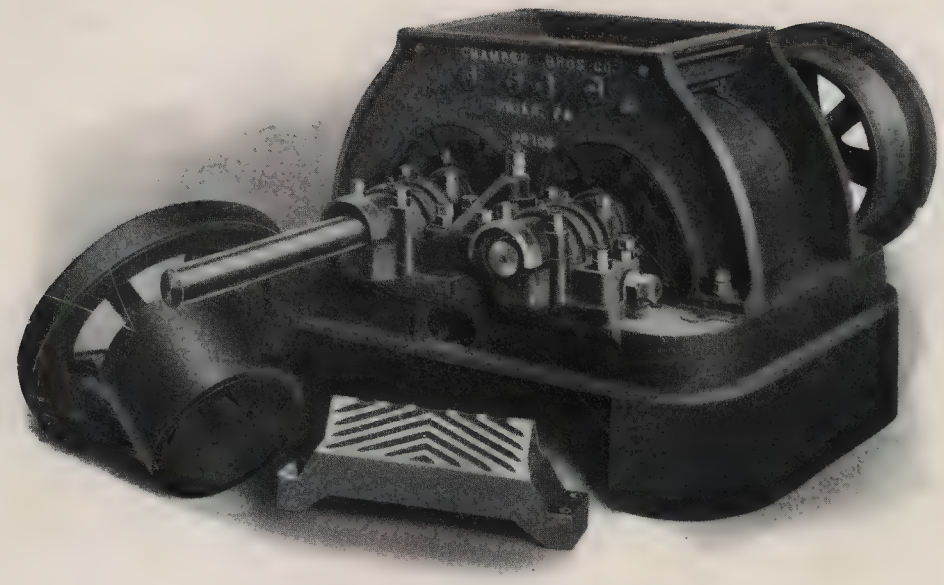
Height 5 feet 2 inches. Weight about 2,500 pounds.

Driving pulley 24 inches diameter by 4-inch face.

Normal speed 240 R. P. M.

Bucket wheel 36 inches diameter, made of steel plate reinforced with riveted angles.

Illustration shows machine for feeding two ingredients in proportion of two to one.



The Keystone Double Disintegrator

(Patented Oct. 31, 1911.) (See also introductory page 72.)

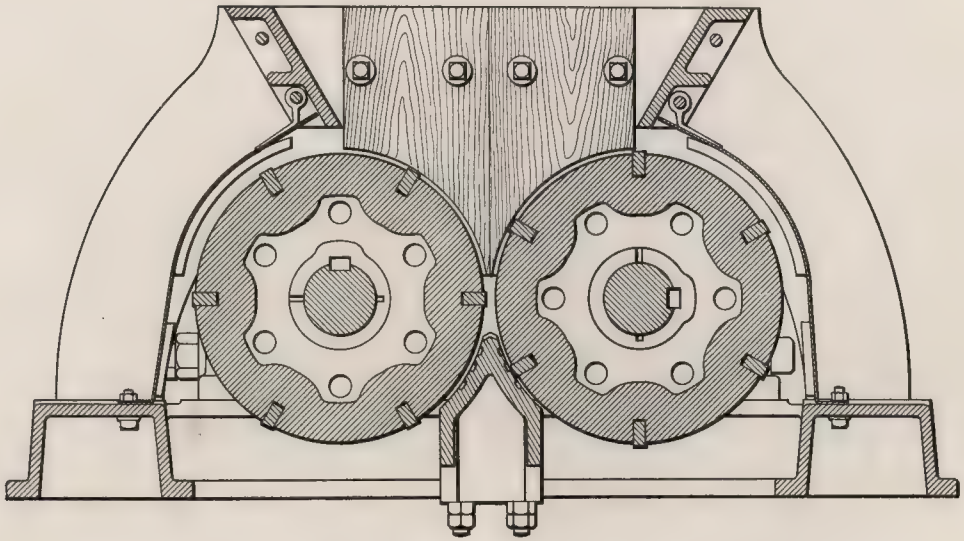
For grinding plastic materials, either wet or dry, and especially clays in which are imbedded small stones, pieces of ore, etc., this new grinder possesses merit over any other grinder we are familiar with.

It is a valuable machine in the preparation of clays for the stiff mud and soft mud processes, as well as for the reduction of materials other than clay.

It is strongly built, simple and with parts easily accessible. The journals are of liberal dimensions, well protected, and fitted with continuous ring oiling devices.

Two revolving cylinders, running 600 revolutions per minute and upwards, according to size, have a number of hardened steel bars inserted and projecting slightly from the cylinder faces. These bars run in close proximity to a double-faced grinding block adjustably secured between the two cylinders and below their centres. The material is first crushed between the bite of the two cylinders, after which it is carried down by the projecting bars and ground against the hard faces of the grinding block.

No gears are employed, each cylinder having an independent belt wheel.



Cross Section of Keystone Double Disintegrator

The steel bars are not only hardened, but are reversible and adjustable.

The grinding block is made of very hard material and so constructed that it may readily be renewed. The maintenance and proper adjustment of these parts are essential.

No. 36 Size Keystone Double Disintegrator
No. 67-D-61

Both rolls 21 inches diameter by 24-inch face. Shafts $4\frac{15}{16}$ inches diameter between journals. Pulley for open belt 18 inches diameter by 16-inch face. Pulley for cross belt 28 inches diameter by 12-inch face.

Unboxed weight about 8,500 pounds.

Capacity for 7,500 bricks per hour and upwards.

No. 30 Size Keystone Double Disintegrator
No. 69-D-83

Both rolls 18 inches diameter by 20-inch face. Shafts $3\frac{15}{16}$ inches diameter between journals. Pulley for open belt 16 inches diameter by 14-inch face. Pulley for cross belt 24 inches diameter by 10-inch face.

Unboxed weight about 6,000 pounds.

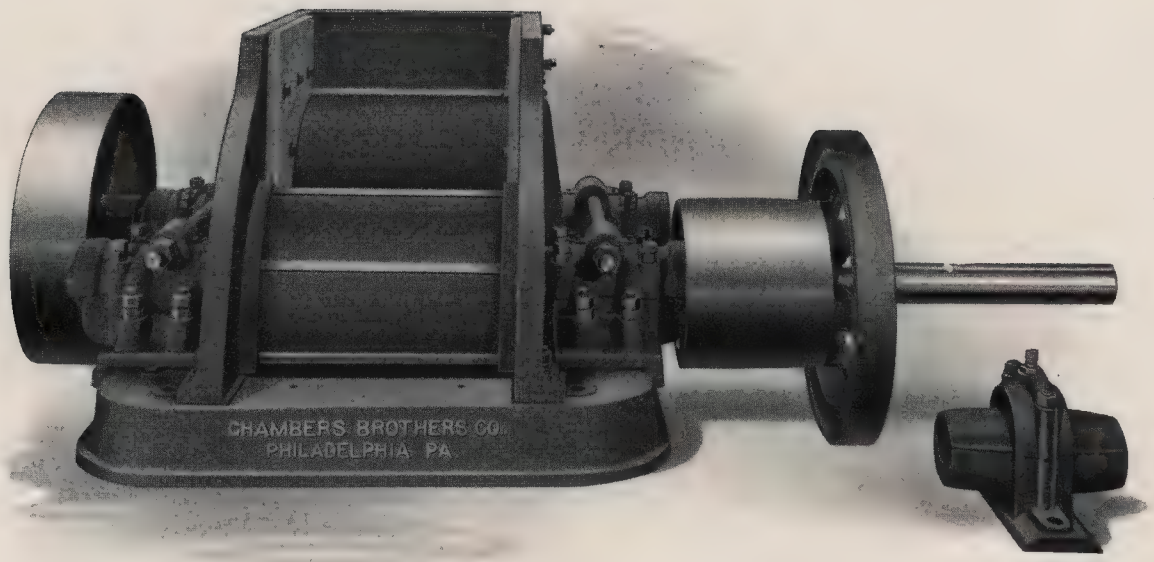
Capacity for 6,000 bricks per hour and upwards.

No. 25 Size Keystone Double Disintegrator
No. 74-D-115

Both rolls 15 inches diameter by 17-inch face. Shafts $3\frac{7}{16}$ inches diameter between journals. Pulley for open belt 16 inches diameter by 12-inch face. Pulley for cross belt 20 inches diameter by $9\frac{1}{2}$-inch face.

Unboxed weight about 4,000 pounds.

Capacity for 4,000 bricks per hour and upwards.



Standard Pattern Clay Disintegrators

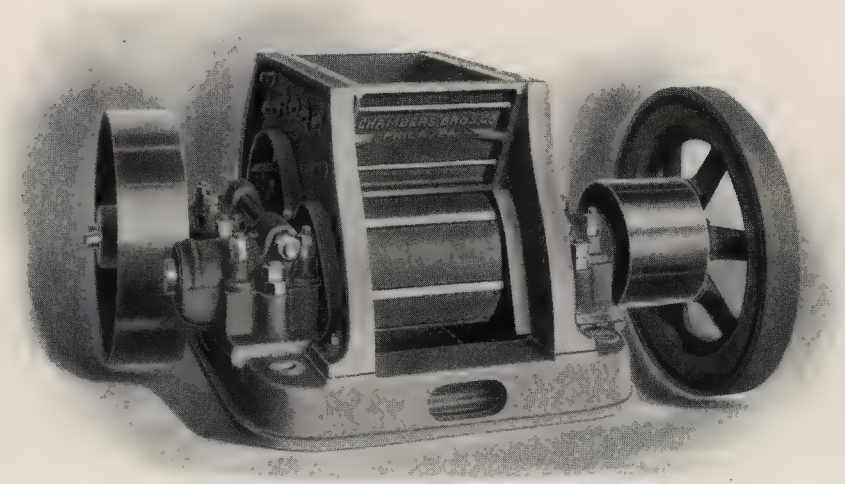
For the preparation of plastic clays carrying the moisture usually found in freshly dug surface clays our Standard Pattern Clay Disintegrators are very popular machines.

We build several sizes suitable for capacities ranging from about 2,500 to 10,000 bricks per hour.

One roller is driven at high speed, say 600 to 700 revolutions per minute, while the other acts merely as a feed roll, and makes from 50 to 100 turns per minute. The essential feature, consisting of one or more continuous steel bars projecting slightly beyond the face of the fast-running roll, not only insures a chipping action against lumps or strong, tough clays, but upon striking a stone causes it to be thrown out, as by centrifugal force, upon the opposite side of the feed hopper from which the material is being fed. Stones weighing as much as seven pounds and smaller to the size of one-half inch in diameter have been thrown out by our Disintegrators. Small pebbles are crushed and ground up with the clay.

Among the superior features embodied in this Clay Preparing Machine we invite attention to the broad, heavy iron bedplate. The parting strain between the two cylinders is taken by two heavy through bolts passing from one journal box to the other, and also affording means of regulating the distance between centres and the degree of fineness to which the clay may be prepared.

The journal boxes of fast-running cylinder are ring oiling. The six steel bars are reversible and adjustable for height. An improved form of feed box prevents escape of clay at sides of hopper.



No. o Size Standard Pattern Disintegrator

No. 0 SIZE has cutting roller of hard iron 12 inches diameter and fitted with six hardened reversible steel bars. Feed roller 20 inches diameter. Steel shafts, journal boxes made in halves and babbitted. Those on fast roller are ring oiling. Slow roller adjustable as to position. Bed plate of heavy box pattern. Tight-fitting shoes in iron feed hopper.

Weight about 2,700 pounds.

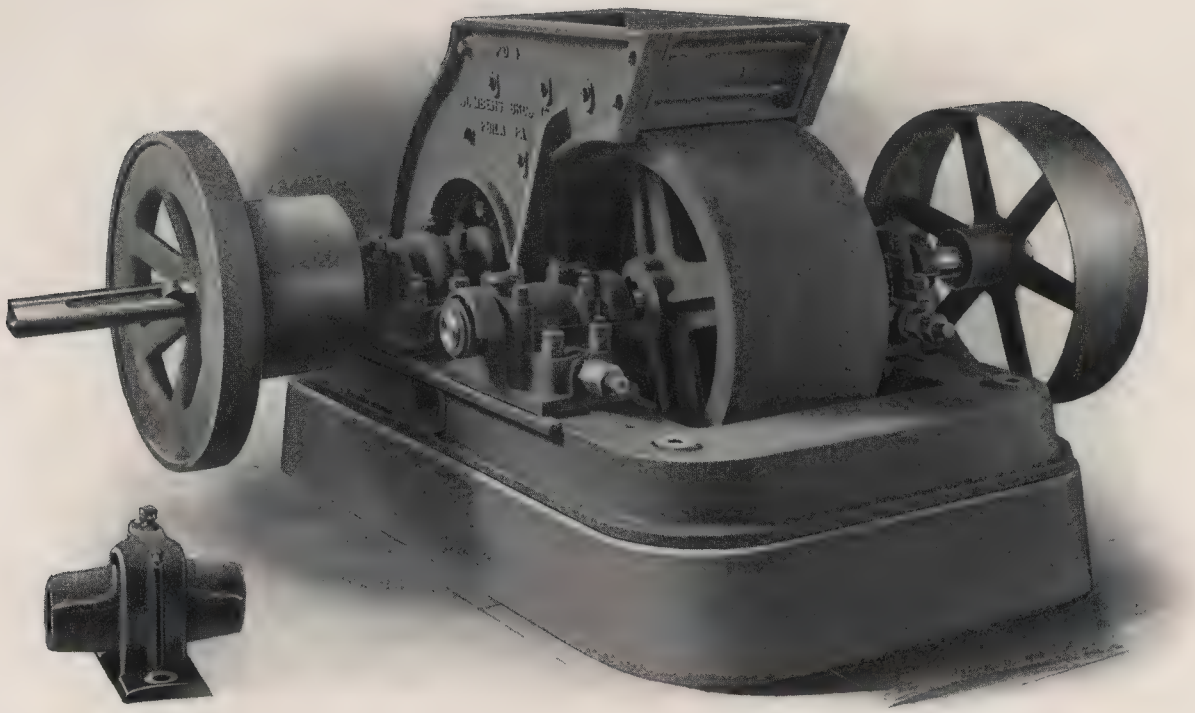
Height from floor to top of hopper 27 inches. Bed plate is 37 inches wide by 50 inches long. Pulley on slow roller 24 inches diameter, 6-inch face; on fast roller 12 inches diameter by 8-inch face.

No. 1 Size Standard Disintegrator

This machine has both rollers 18 inches diameter by 16-inch face. Fast-running roll fitted with six hardened reversible steel bars.

Unboxed weight about 4,500 pounds.

Height from floor to top of hopper 31 inches. Bed plate 48 inches wide by 60 inches long. Pulley on slow roll 30 inches diameter, 6-inch face; on fast roll 16 inches diameter by 12-inch face.

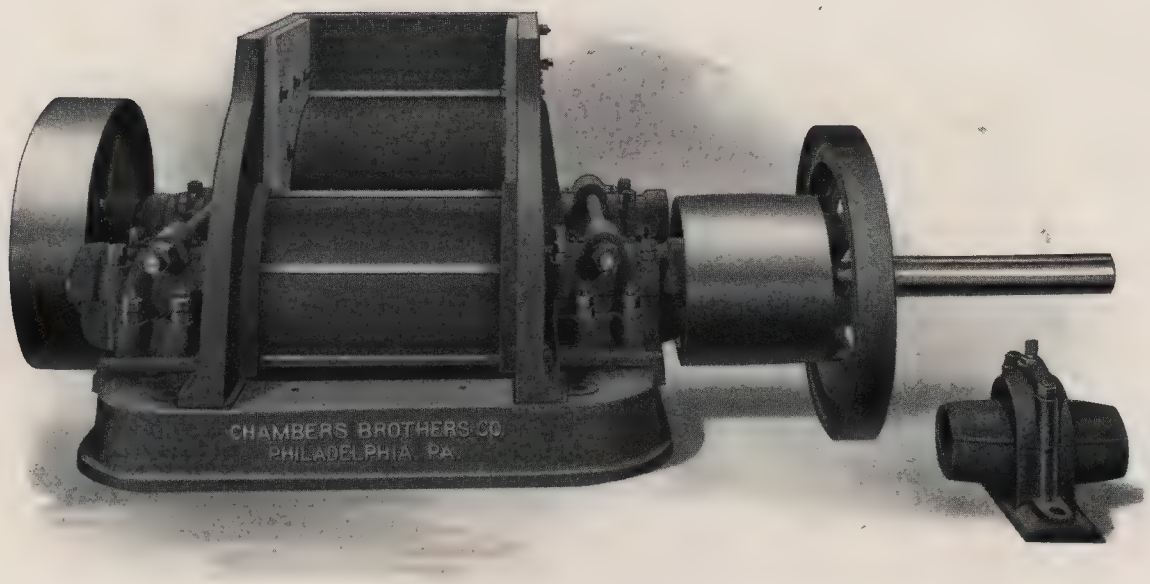


No. 2 Special Standard Pattern Disintegrator

This machine has feed roller 30 inches diameter and fast-running roller 18 inches diameter by 16-inch face, fitted with six steel bars.

Weight is about 5,300 pounds, and we guarantee it to have capacity to prepare clay for 5,000 to 7,000 bricks per hour.

Height from floor to top of hopper 37 inches. Bed plate 54 inches wide by 72 inches long. Pulley on slow roll 30 inches diameter, 7-inch face; on fast roll 16 inches diameter by 12-inch face.



No. 2 Size Standard Pattern Disintegrator

This machine has feed roller 30 inches diameter by 24-inch face, with cutting roller 18 inches diameter.

Unboxed weight about 7,000 pounds.

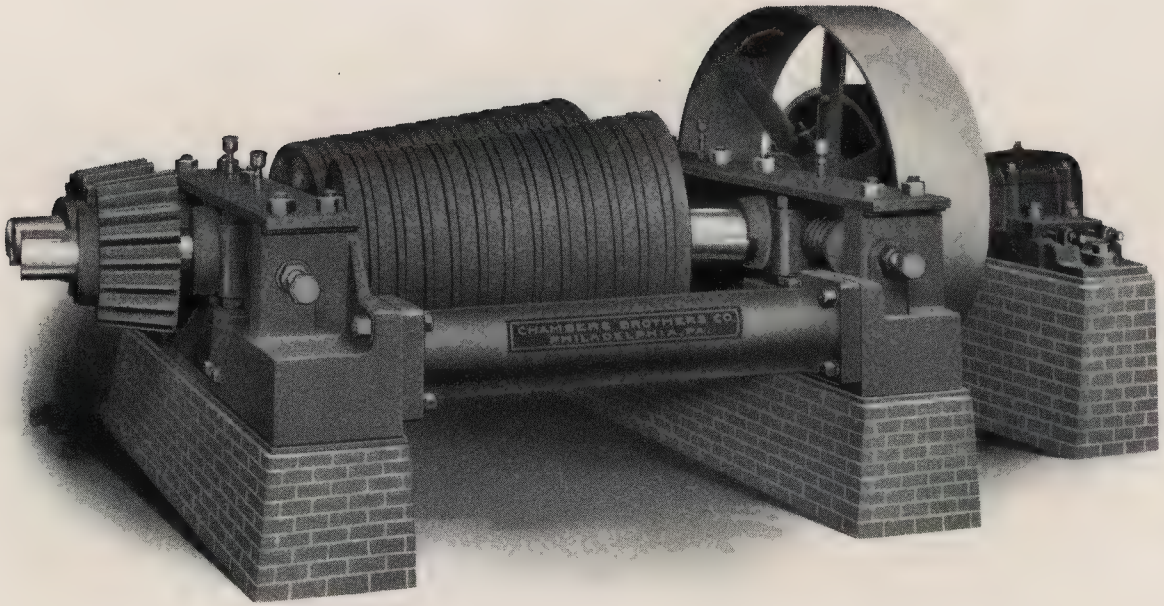
DISINTEGRATOR No. 3.—Same style as No. 2, but has rollers 30 inches wide on face. Shafts are proportionately heavier.

Unboxed weight of machine about 8,200 pounds.

DISINTEGRATOR No. 4.—Size and capacity of "No. 2 Special," but built under an unusual specification. Drawing No. 62-D-35.

Fast roll shaft $4\frac{7}{16}$ inches diameter between journals. Slow-roll shaft $3\frac{15}{16}$ inches diameter straight through. Shafts of unusual lengths and arranged for both belts on same side.

Unboxed weight 6,000 pounds and upwards, dependent upon specifications.



Stone Extracting Conical Clay Rolls

This illustration shows our No. 10 size Conical Clay Rolls with the feed hopper omitted. It is so constructed that the clay is fed near the smaller end of rolls, in consequence of which rounded stones are squeezed out of the clay because of the gradually increasing diameter, or conical shape of roll, and discharged from the upper end. Small stones are crushed with the clay.

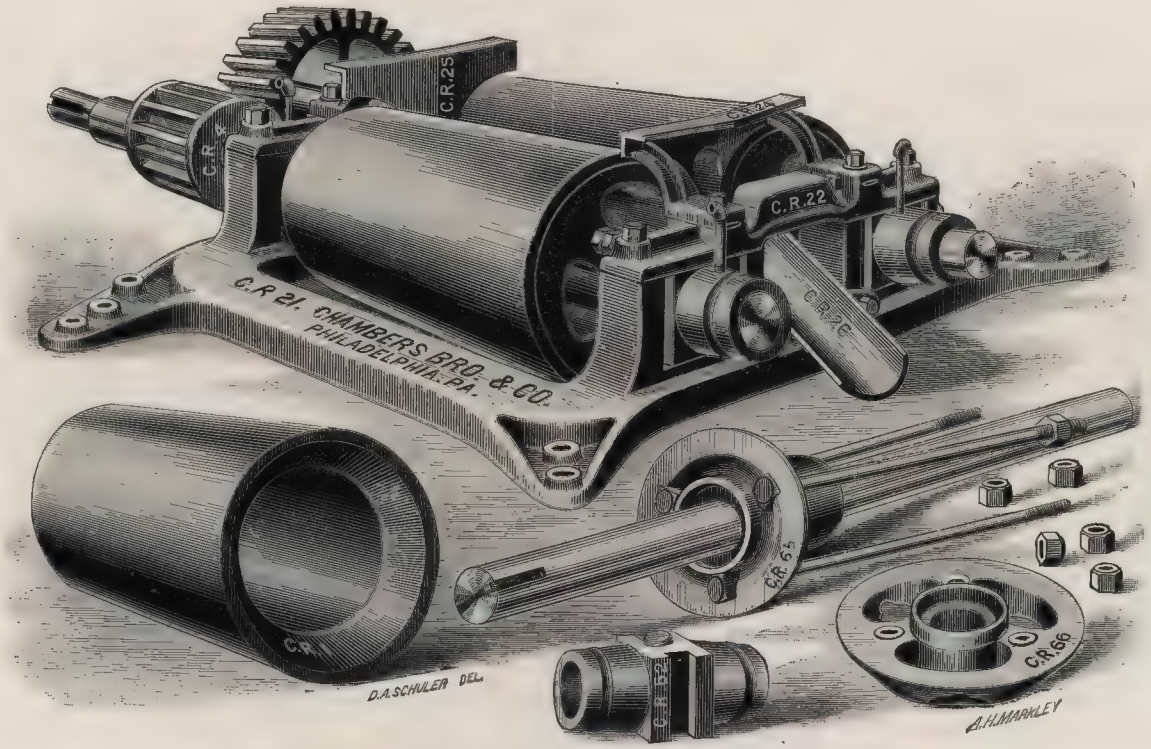
This separating action is further facilitated by making the respective roll faces of right and left screw threads. Occasionally one face is threaded and the other plain or both rollers may have plain faces. (See page 87.) This type of machine is most largely used for treating clays carrying water-washed limestone pebbles.

Dimensions of No. 10 Conical Rolls 104-A-65

Bed plate measures about 5 feet 3 inches by 5 feet 10 inches. Rollers 31 inches long, 24 inches diameter at large end and made threaded or plain face. Shafts are $4\frac{15}{16}$ inches diameter between journals. Steel gears. Friction clutch pulley 44 inches diameter by 12-inch face. Relief springs of 1-inch diameter rod are placed back of journal boxes.

Unboxed weight, including feed hopper, is about 8,900 pounds.

Unboxed weight, exclusive of hopper, is about 8,500 pounds.



Stone Extracting Conical Clay Rolls—No. 3 Size

Showing construction and provision for renewing roll shells.

The face of the rolls is cast of a very hard metal with beveled ends having babbitted faces true with the outer face and against which the roll heads are clamped. This permits of convenient renewal of roll faces.

No. 3 size is made with differential gear, but sizes Nos. 2 and 10 are made only with both gears of same diameter.

Dimensions of No. 3 Conical Rolls

Smooth face only.

Bed plate measures about 4 feet by 5 feet 9 inches. Rollers 24 inches long, 18 inches diameter at large end, 15 inches at small end. Shafts are $3\frac{7}{16}$ inches diameter between journals. Semi-steel gears. Friction clutch pulley 30 inches diameter by 6-inch face.

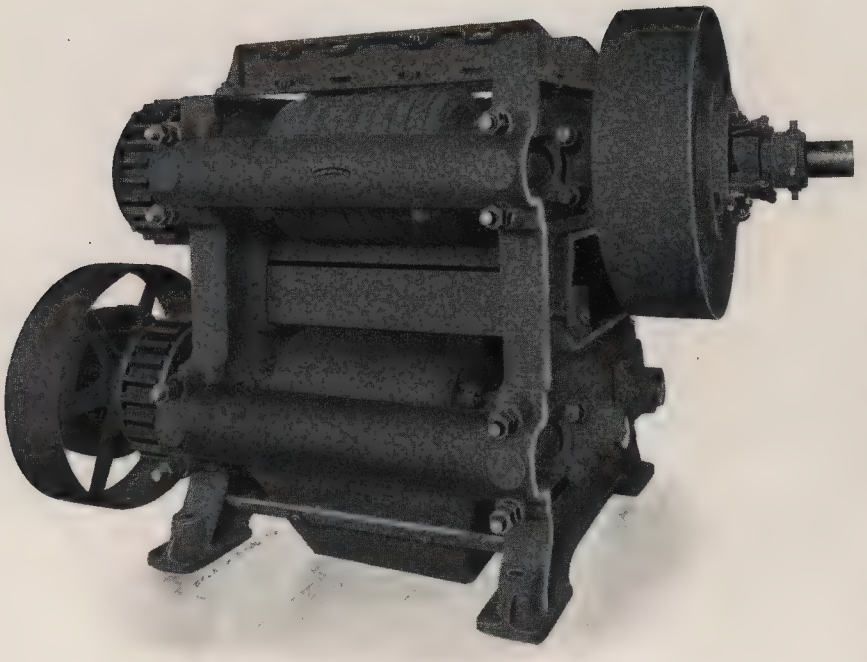
Unboxed weight about 4,100 pounds.

Dimensions of No. 2 Conical Rolls

Smooth face or threaded shells for roll faces.

Bed plate measures about 4 feet 3 inches by 5 feet 6 inches. Rollers 24 inches long, 22 inches diameter at large end and 16 inches diameter at small end. Shafts are about 4 inches diameter between journals. Gears both of same diameter, of semi-steel or cast steel as ordered. Friction clutch pulley 36 inches diameter by 7-inch face.

Unboxed weight about 5,800 pounds.



Compound Clay-Crushing Rolls with Short Shafts

SHOWING SCREW THREADS ON FACES OF UPPER ROLLS.

Driving pulley close to journal boxes and upper rolls fitted with shells having screw threads for removing stones from clay.

Unboxed weight about 13,000 pounds.

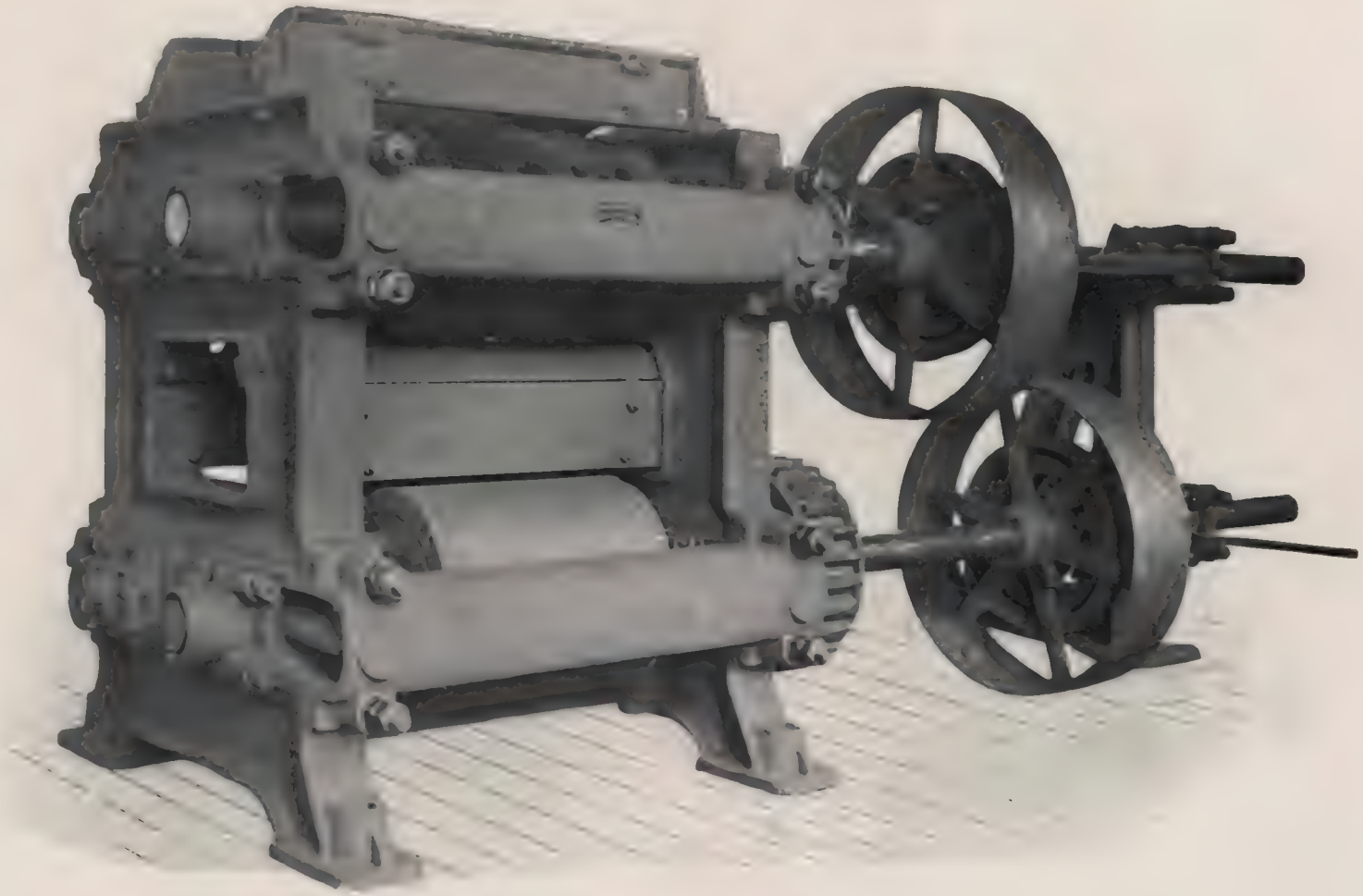
Compound Clay-Crushing Rolls

In this machine both pairs of rolls are 20 inches diameter by 24-inch face, and are all made with our detachable shells, as illustrated on page 87. The upper rolls are designed to run as much as one inch apart, but may be set closer if desired.

They are geared about 2 to 1, the driving pulley being placed upon the shaft of the faster roll. Both rolls may be smooth face, or one of the pair may be studded with hardened steel bolts, as shown in the illustration on page 89, or with steel bars, as used on our disintegrators shown on page 85.

The lower rolls can be run close together and thus act as fine grinders on the material partially prepared by the upper set. The driving shafts are 4 inches diameter, and are journaled in babbitted boxes of special construction so designed that neither the weight nor the strain incident to work comes on the parting line between box and cap.

In addition to being thoroughly protected from dirt, these boxes are made with large pockets packed with greased waste. Either friction clutch or plain pulleys may be used, those shown being 36 inches diameter by 10½-inch face. Heavy coil springs are placed behind the journal boxes, one roll in each pair, to afford relief when necessary.



The Chambers Compound Clay-Crushing Rolls

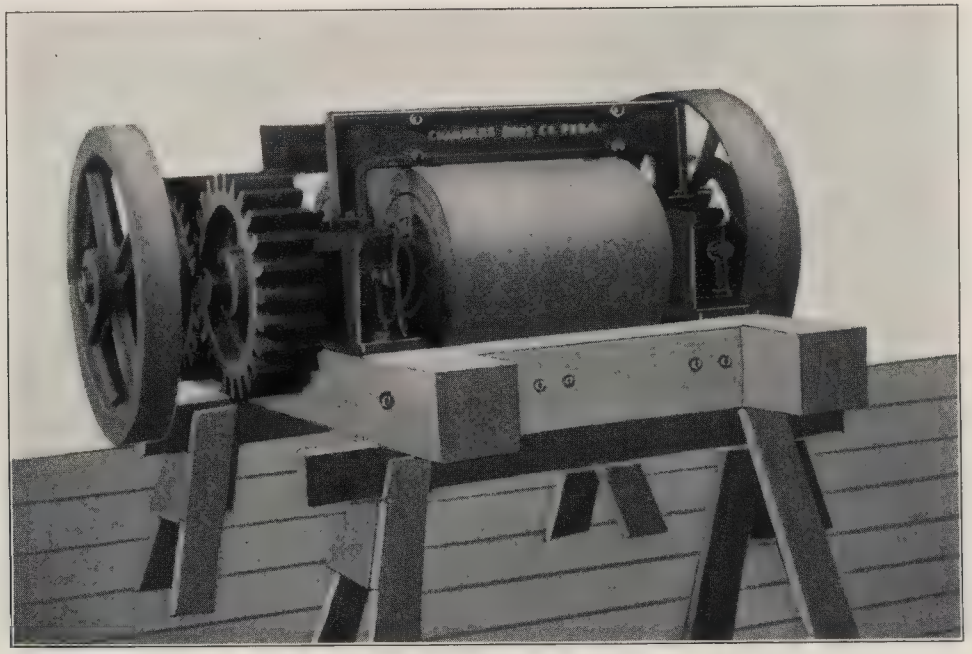
SHOWING SPUDS IN FACE OF UPPER ROLL.

Weight of machine as shown about 15,000 pounds.

Height from floor to top of hopper 5 feet 7 inches.

Floor space, including gears but exclusive of driving pulleys, is 5 feet 3 inches wide by 6 feet long.

When the application of power requires it, we build this machine with long driving shafts and provide a mounted pedestal with babbitted journals. The standard construction is with shorter shafts and with driving pulleys close to journal bearings, as shown on page 88.



Straight-Face Clay Rolls Without Spring Boxes
Journaled in Iron Frames Mounted Upon Wooden Housing

No. 5 Straight-Face Rolls Without Spring Boxes

Straight-face Crushing Rolls, made with removable shells, 24 inches long by 20 inches diameter. Gears 6 inches face; shafts $3\frac{7}{16}$ inches diameter. Long journal boxes mounted in self-contained iron frame secured to framing of 8 x 8-inch hard wood.

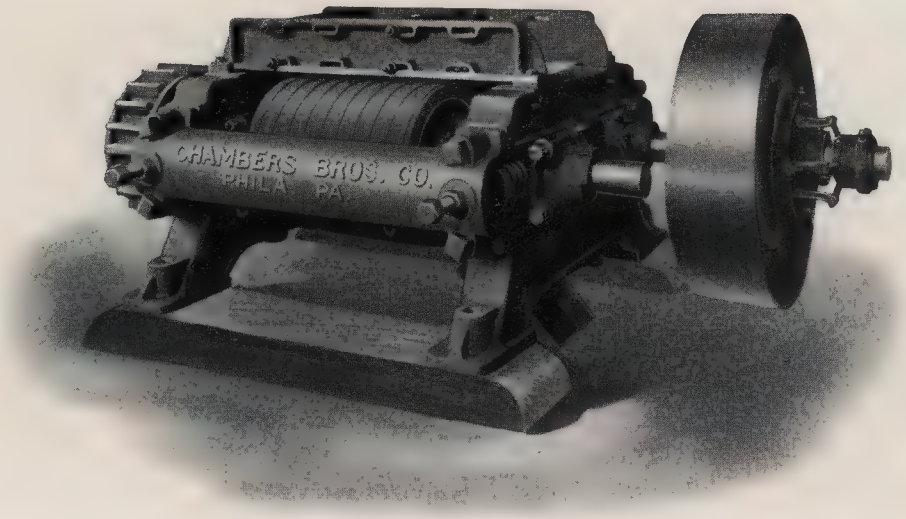
Are provided with an iron feed box with adjustable scrapers. Rolls may be set to run from $\frac{1}{8}$ to $\frac{1}{2}$ inch apart. With fiy wheel and 36 x 7½-inch friction clutch pulley.

Weight about 4,950 pounds.

No. 6 Straight-Face Rolls Without Spring Boxes

Same design and embody same features as No. 5. They are 21 inches long by 14½ inches diameter. Are provided with iron feed box, fly wheel and friction clutch pulley 30 x 6 inches.

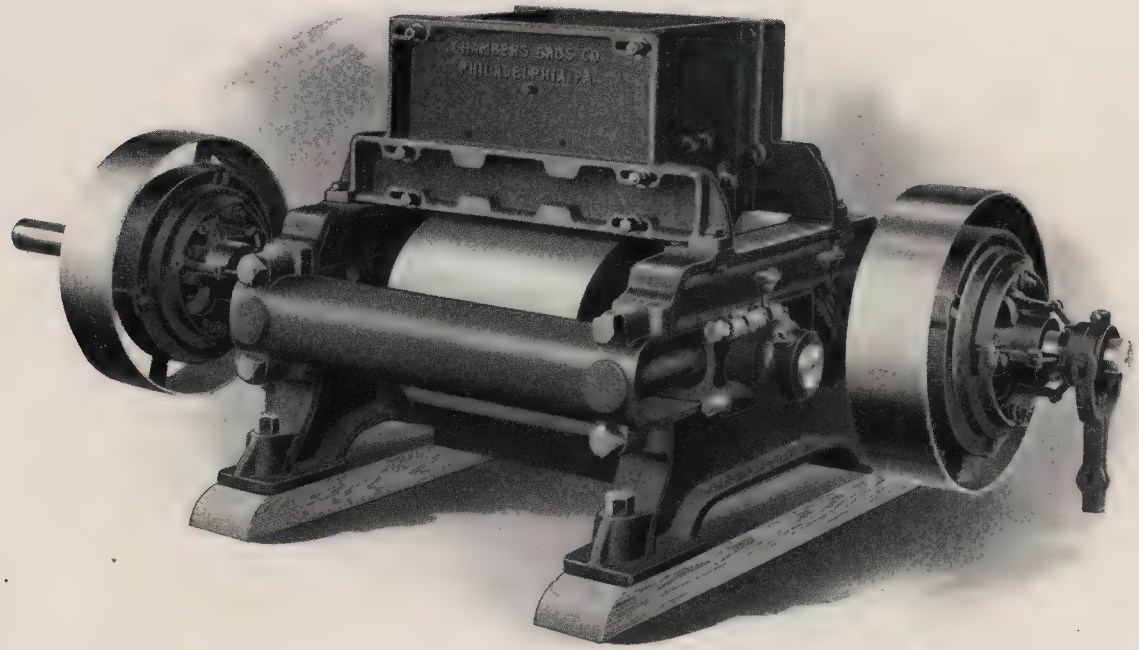
Weight about 3,100 pounds.



The Chambers Straight-Face Rolls with Spring Boxes—Size No. 8

The rollers are 20 inches diameter by 24-inch face. Are exceedingly hard and so constructed that the shell or grinding surface may be renewed without renewing the whole roll. Shafts are 4 inches diameter with babbitted journal boxes of special construction. One roller is held in place by very heavy adjustable coil springs. Gears are shrouded. Friction clutch driving pulley 36 inches diameter.

Unboxed weight about 7,500 pounds.
Dimensions of bed plate about 5 feet by 5 feet 6 inches.
Height from base of frame to top of hopper 36 inches.



Fine Grinding Rolls No. 9

Rolls 20 inches diameter by 24-inch face. Shafts about 4 inches diameter. No gears are used, but an independent friction clutch pulley is provided on each roll shaft, permitting of a slightly differential speed for the rolls, and also permits of their close adjustment.

Feed hopper shown has a series of steel spreaders upon which the material as fed into the machine falls and is distributed so as to finally reach the roll distributed over the whole face instead of falling all on one place. A hard-wood shoe extending down to the bite of the rolls makes a tight joint at the ends of the rolls and prevents escape of the material.

The frame of the machine is heavy and substantial, and while the journal boxes of one roll are held rigidly in place, those of the other have stiff, heavy coil springs mounted behind the journal boxes, thus permitting one roll to yield in case of foreign substances being fed to the machine. Journal boxes are of liberal length, made in halves and babbitted.

Weight of the machine, unboxed, about 8,000 pounds.

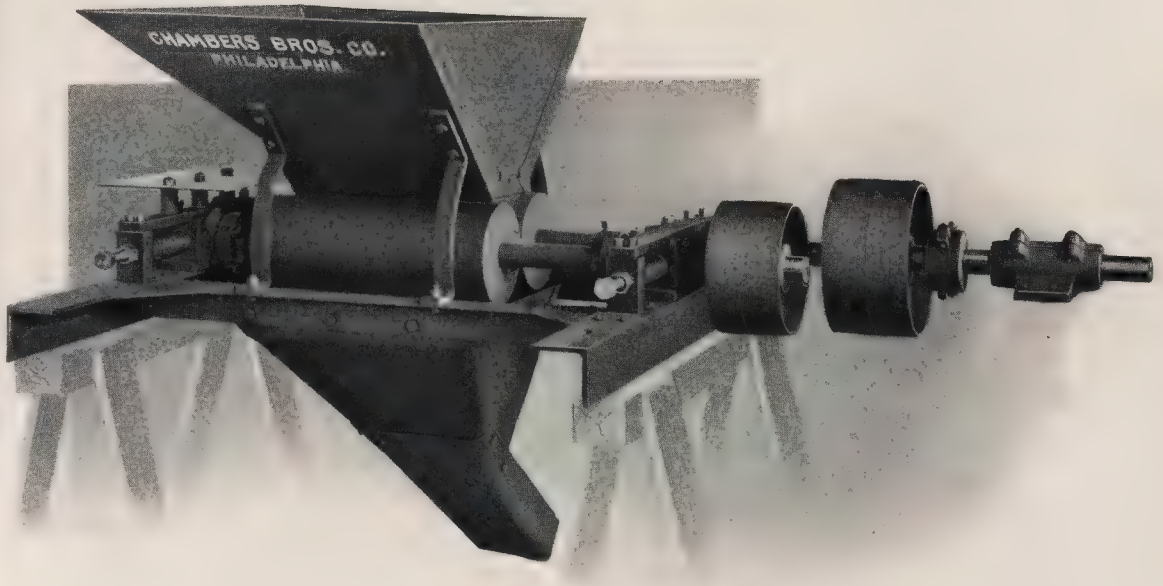
The length of frame from out to out of feet measured at right angles with the shafts is 4 feet 11 inches.

The width from out to out of feet measured parallel with the length of the shafts 4 feet 5 inches.

The extreme over-all measurement from the end of one shaft to the end of the other is 11 feet 6 inches.

Height from floor line to the top of feed hopper 4 feet.

The clutch pulleys are each 30 inches diameter by 8-inch face.



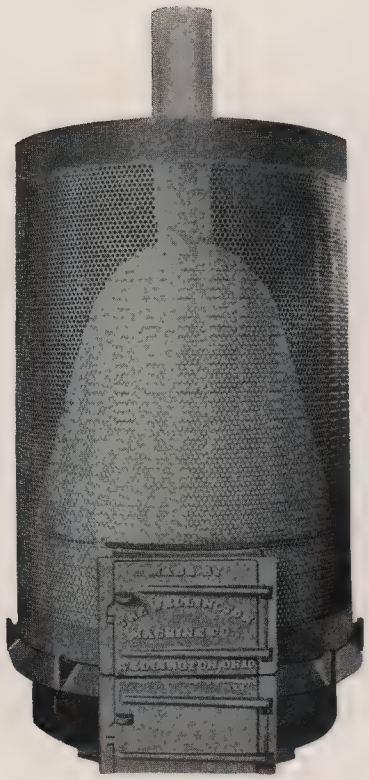
Sand-Grinding Rollers

Drawing 88-B-11.

For preparing molding sand for soft-mud brick molds and sand for use in the Automatic Sanders of Auger Brick Machines.

These rollers are 8 inches diameter by 20-inch face. They are driven by independent belts, the journal boxes of one roller being provided with relief springs. They are sometimes constructed so that one roller can be given a lateral motion.

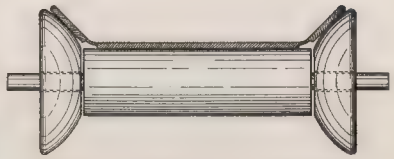
Unboxed weight about 1,300 pounds.



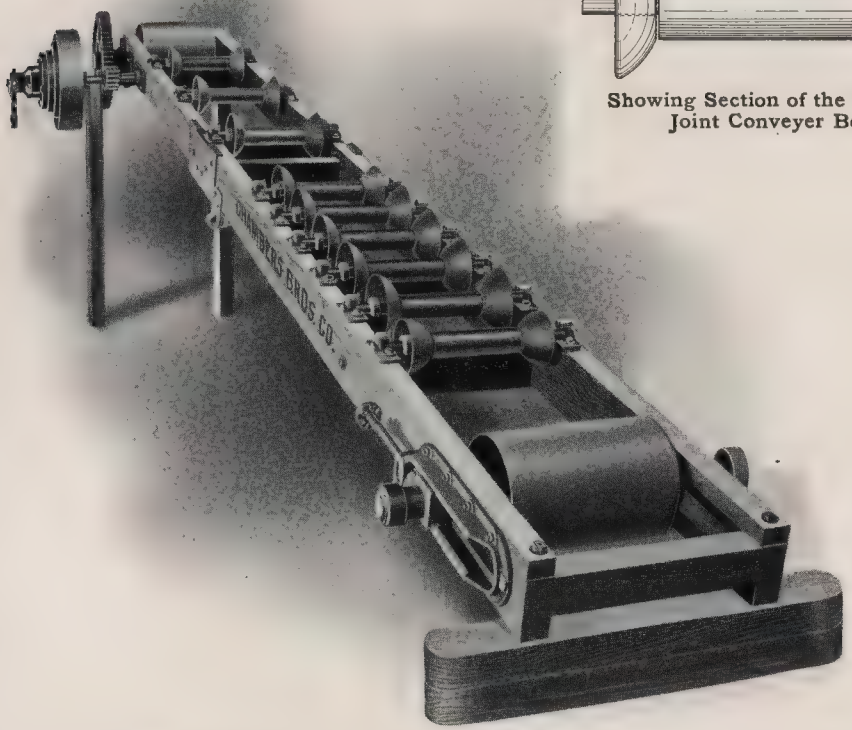
The Standard Sand Dryer

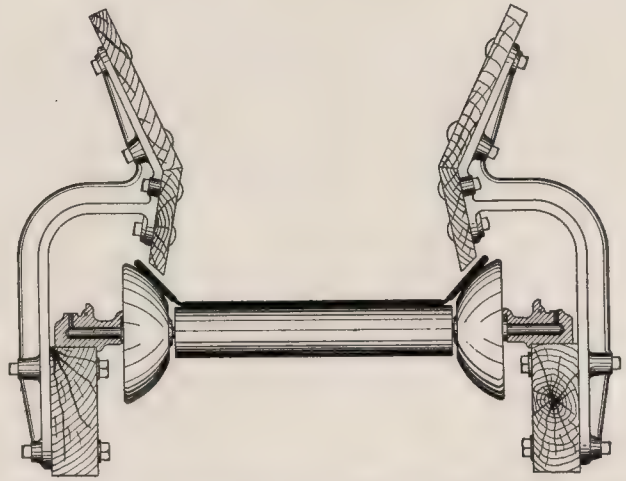
Made with perforated metal screen.
We do not furnish section of smokestack as shown in cut.
Diameter over all 3 feet 1 inch. Height 4 feet 9 inches.
Capacity 15 to 20 cubic yards per day.
Weight 1,175 pounds.

Belt Clay Conveyers and Elevators



Showing Section of the Flexible Joint Conveyer Belt



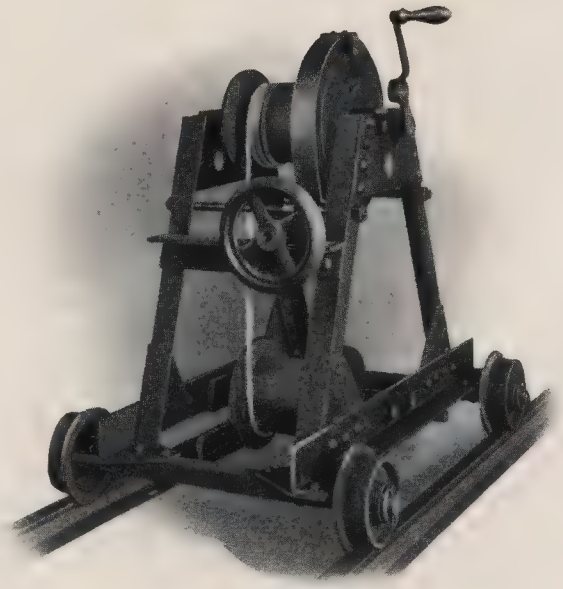


Showing Arrangement of Feed Hopper Over Lower End of Flexible Joint Conveyer

The illustration shows framework and machinery of a Belt Clay Elevator of pattern that we have tested for several years with success. The belt is omitted from the illustration to better show the form of roller, but is made especially for this use and has a flexible joint running lengthwise of the belt and about four inches from each edge.

The belt thus easily conforms to the flat-trough shape required by the rollers and prevents any spilling of clay over the edges. We are enabled to dispense with the usual side boards extending the entire length of elevator, designed to prevent spilling, but never very efficient and one cause of much wear on the belt. The friction clutch pulley used is 24 inches diameter. When making 125 revolutions per minute, the conveying belt travels about 120 feet per minute. Standard widths are for 18-inch and for 24-inch belts.

The rollers are made of steel pipe with finished iron gudgeons 5/8-inch diameter running in bored boxes having one end closed and fitted with self-closing oil lids. These boxes are adjustable as to position and are lipped over the edge of the side timbers. At each end of the pipe rollers are cast-iron flanges of large diameter and arranged to run freely on the roller gudgeons. This obviates wear on the conveyer belt, keeps the clay central and delivers it in an even, compact flow over the upper drum. The drums are journaled in babbitted boxes made in halves; are both provided with adjustable scrapers.



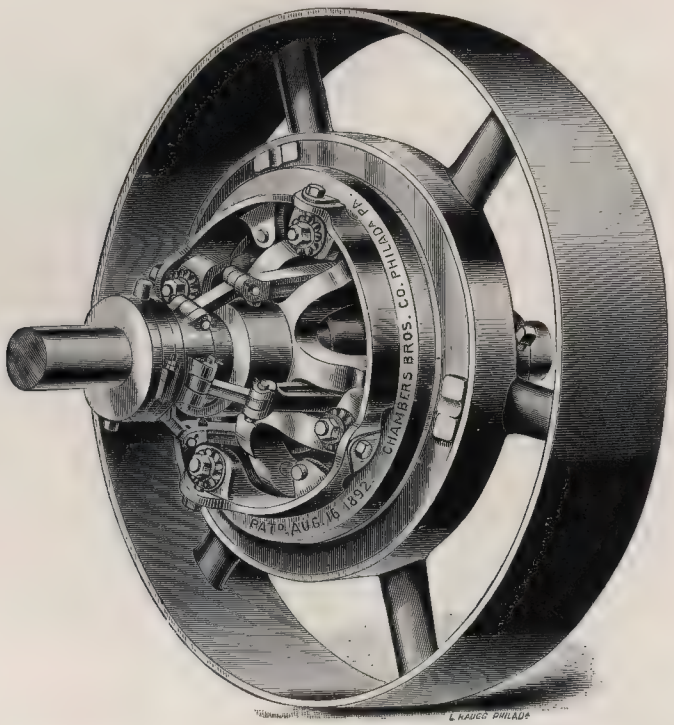
Special Design of Portable Winch

Mounted upon wheels for convenience in moving from place to place. Fitted with a friction brake band operated by hand wheel. The machine is not a hoisting winch, but is designed to control the lowering of material on trucks or cars. Drawing No. 88-C-116.

Bucket Elevators

We furnish bucket elevator machinery where conditions require the use of this pattern.

The overhead machinery is in babbitted boxes, and we recommend the traction wheel instead of sprocket for driving the chain. These have turned rims, and the grip is ample to do all the work that either buckets or chain should be called upon to do. We also supply these elevators with buckets fastened to cotton belts. Overhead driving gear is fitted with friction clutch pulley, plain pulley or sprocket and chain, as desired.



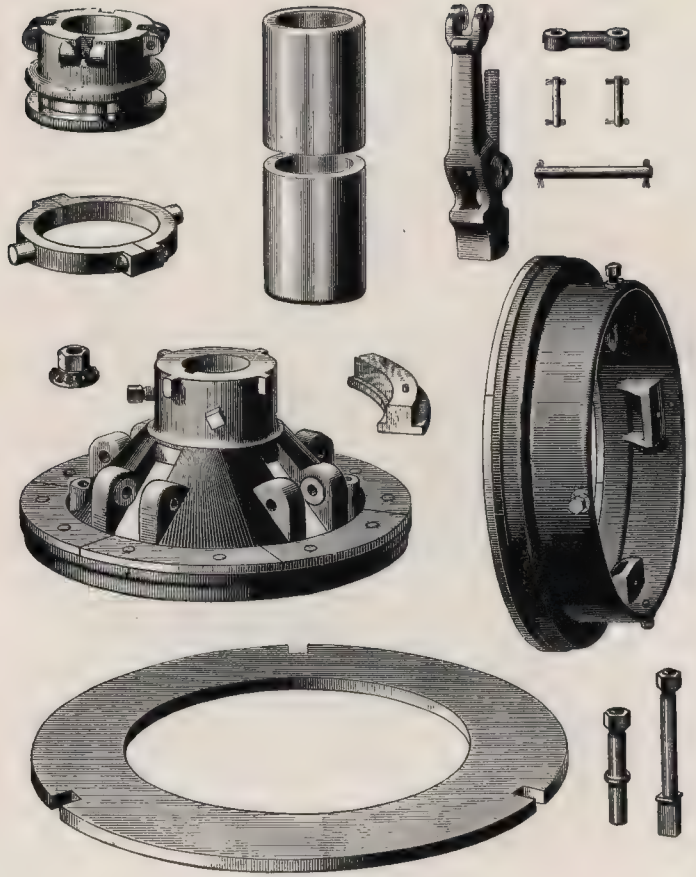
Friction-Clutch Pulleys used on our Machinery

We have for many years used this clutch upon our brickmaking machinery, having taken up its manufacture as one designed upon correct principles and free from objectionable features. The different parts have been enlarged and strengthened, as found desirable by continued use under severe conditions, and patterns made for much larger and heavier clutches than originally offered.

Manufactured under a system securing interchangeability of all parts, and duplicates may be ordered by giving the number cast upon them.

We are prepared to furnish promptly from existing patterns pulleys of 20, 24, 30, 36, 40, 44, 48, 54, 60, 66 and 72 inches diameter. We carry in stock clutches of sizes numbered 4, 5, 6, 7, 7A, 10 and 15.

Orders or inquiries should specify diameter of pulley, width of belt, diameter of shaft, number of revolutions per minute.



PARTS OF CLUTCH

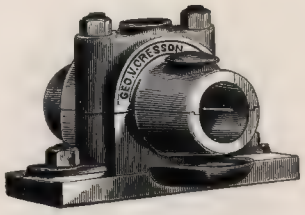
Order duplicate parts by giving the numbers cast upon part wanted.

From this we can select the size clutch to meet the requirements and insure the use of a clutch of ample capacity to transmit the required horse power. Thus, a 48-inch diameter of pulley may be fitted with a number 7, 7A or 10 clutch, according to the operating conditions.

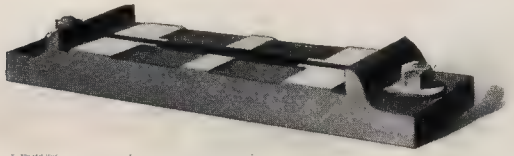
Net prices quoted upon application, giving these particulars.

Shafting, Pulleys and Journal Bearings

We are prepared to furnish shafting, pulleys and appurtenances for the transmission of power with complete outfits of driving belts suitable for our machinery.

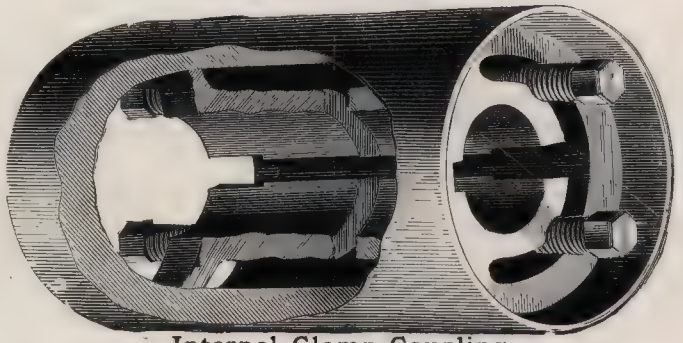


Ball-and-Socket Pillow Block Bearing. Plain, or Babbited and Ring Oiling



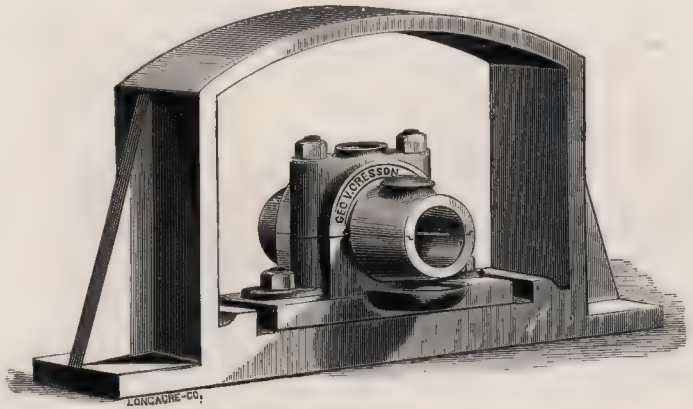
Sole-Plate for use with Pillow-Block Bearings, when mounted on Masonry

Furnished with or without adjusting screws.



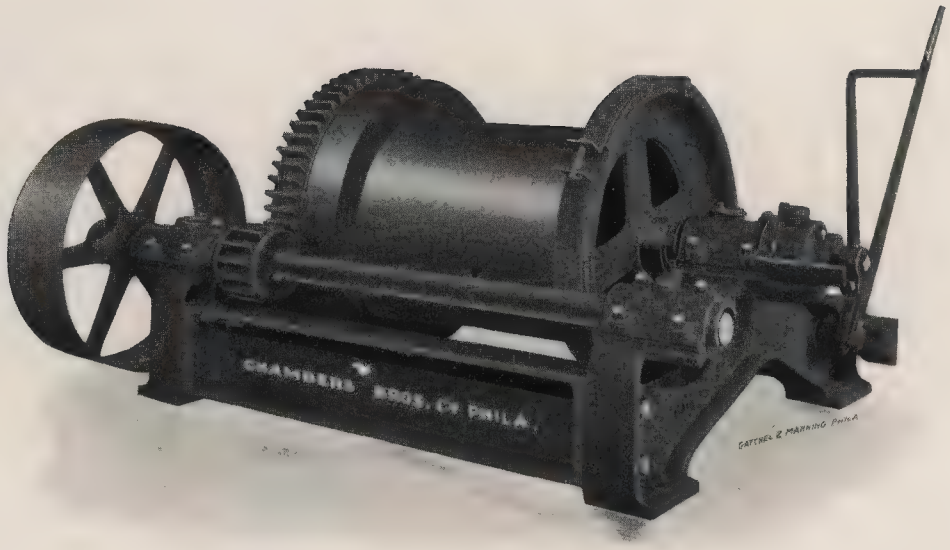
Internal Clamp Coupling

Adjustable Drop Hanger for Overhead Line Shaft



Wall Box with Pillow-Block Bearing

Balanced Iron Pulley



No. 1 Iron-Frame Heavy Friction Hoist
Also Built With Bevel Gear

This is a strong, well-built machine, embodying principles that have been successfully employed in the best machinery of this class for many years. Drum 24 inches diameter by 29 inches between flanges.

The friction in head of drum works in a double-V groove and utilizes both sides of the friction blocks for drive purposes.

The gear is 4½-inch face and of large diameter for size of drum. Driving shaft is $2\frac{15}{16}$ inches diameter, and all journal boxes are made in halves and babbitted. The clutch mechanism is provided with a positive throw-out, so that the drum is sure to stop when friction lever is thrown out. The thrust screw works in a phosphor-bronze nut. Brake-band lever is counterweighted. Weight of machine unboxed is 4,500 pounds. Drive pulley is 30 inches diameter, 9½-inch face. Will carry 2,000 feet of ⅝-inch diameter rope.

Floor space of frame, exclusive of operating levers, is 6 feet 6 inches by 4 feet 10 inches; including pulley and shaft, 7 feet by 4 feet 10 inches.

An iron gear shield is included, although not shown in cut.

When raising a loaded car of 1½ cubic yards' capacity up a 15 per cent. grade at a speed of about 350 feet per minute this machine requires 10½ horse power.

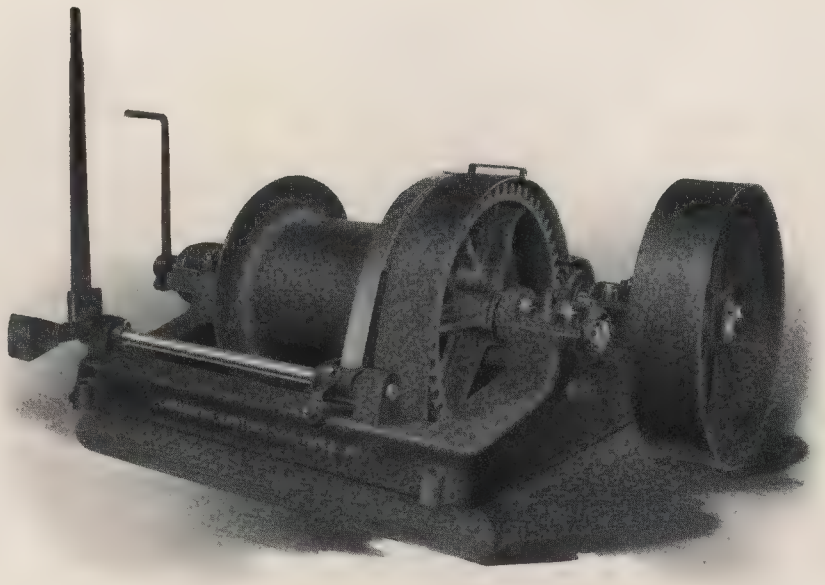
No. 1 Bevel Gear Friction Hoist

Standard construction, Drawing No. 60-D-149.

Special reverse construction, Drawing No. 61-D-6.

Drum 24 inches diameter by 29 inches between flanges. Bevel gear 5-inch face. Drawing shaft $2\frac{15}{16}$ inches diameter. Driving pulley 30 inches by 9½ inches. Floor space, including pulley and shaft, 7 feet by 7 feet 6 inches.

Special Bevel-gear Hoist, with 28-inch diameter drum, No. 61-D-6.



No. 2 Iron-Frame Friction Hoist
Also Built With Bevel Gear

This is built on the same lines as our No. 1 Hoist, but is of smaller size.

Box-pattern bed plate is made in one casting.

The frictional device is practically the same as on our larger hoist.

The drum is 17 inches diameter by 19 inches width between flanges, and has capacity to carry about 2,200 feet of $\frac{7}{16}$-inch diameter wire rope.

It has good, strong, heavy gear, driving shaft is $2\frac{7}{16}$ inches diameter and is fitted with pulley 30 inches diameter by 6½-inch face.

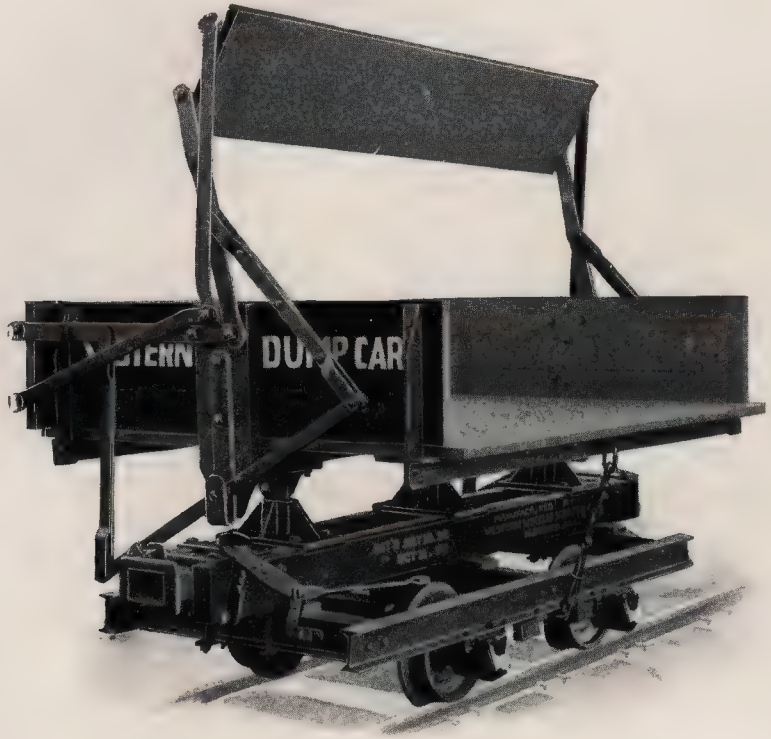
The brake band is faced with end-grain maple blocks and has counterweight to insure its throwing off promptly. Rope speed from 220 to 330 feet per minute.

The hoist is ample to pull one loaded 1½-yard clay car at a time on a 15 per cent. grade.

Unboxed weight is about 2,500 pounds.

Proposed No. O Size Spur Gear Hoists

Drum 28 inches diameter on shaft $4\frac{7}{16}$ inches diameter. Pinion and gear of open-hearth steel. Driving shaft $3\frac{7}{16}$ inches diameter. Pulley 40 inches by 12 inches. Either ¾-inch or ⅞-inch diameter cable may be used. Safe load about 20,000 pounds on a 23 per cent. grade.



One and One-Quarter-Yard Side Dump Car with Steel Sills

Illustrating convenient position in which side board can be placed on all sizes of the Western Cars for loading by hand.

The standard car has capacity of 1¼ cubic yards and is 24-inch gauge; the wheels are 12 inches diameter and made of the best car-wheel iron, the face being smooth and properly chilled; axles of 2-inch steel with bronze journal bearings 1⅞ x 4½ inches; improved journal boxes and improved spring couplers.

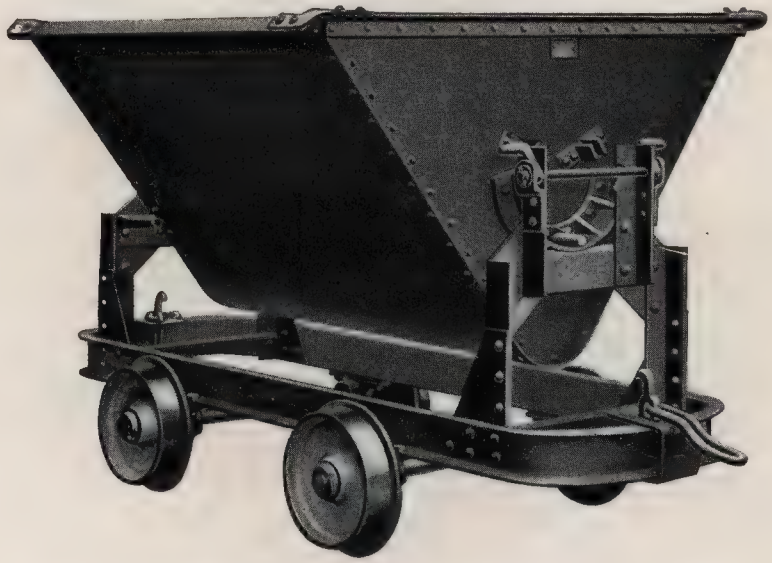
Showing Dumped Position

Dumping Angle is about 47 Degrees

The height of the top of the 24-inch gauge car, with capacity of 1¼ cubic yards, is 42 inches above the top of the rail it stands on. This is no higher than other cars of 18-inch gauge, while the bed, in dumping, assumes a more nearly perpendicular position. Contractors will recognize the advantage of the wider gauge, as lessening the danger of the car being thrown off the track in dumping, and in the economy of keeping the track in good condition.

Stock Sizes of Western Dump Cars

		Approximate Weight Unboxed, in lbs.
1¼-yard	Wooden Frame Side-Dump Car	1,400
1¼ "	Steel " " "	1,500
1½ "	Wooden " " "	1,800
1½ "	Steel " " "	1,950
2 "	Wooden " " "	2,400
2 "	Steel " " "	2,800
3 "	Diamond-Framed Car	5,000
4 "	" " "	6,000



No. 240 Either Side Rocker Dump Car. All Steel

STANDARD DIMENSIONS

	1 Yard	1½ Yards	2 Yards	3 Yards
Length over all	6 ft. 2 in.	6 ft. 8 in.	8 ft. 1 in.	10 ft.
Width over all	4 ft. 10 in.	5 ft. 4 in.	6 ft.	6 ft.
Height from top of rail	3 ft. 9 in.	4 ft. 3 in.	4 ft. 5 in.	4 ft. 10 in.
Gauge	3 ft.	3 ft.	3 ft.	3 ft.
Weight	950 lbs.	1,350 lbs.	1,750 lbs.	2,610 lbs.

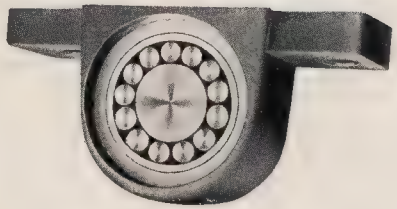
The body is made in one piece (except ends) of steel plate, reinforced with angles in corners and along edges. Frame is steel channel and I beam. Rockers and Y's are heavy malleable or steel castings. Bearings are self-oiling, of bronze. Wheels are of steel or cast iron 14 inches in diameter. Furnished with brakes and drawbars, or spring bumpers, as required, these necessitating extra charges.

Roller-Bearing Barrows

Weight about 100 pounds.

Extra charge for fitting with springs, $1.50 each.

Extra charge for steel slats instead of wood bed and backs, $2.00 each.



Sectional End View of Roller Bearing

The Standard Roller-Bearing Brick Barrow

Will carry 100 bricks easily, and a great favorite with the yard men. Hard-wood frame, well ironed and braced. Stock size wheel 20 inches diameter. Wheels 18 inches diameter to order. Iron wheels with steel roller bearings.

Special Cast Wheels

We manufacture a six-spoke cast-iron wheel in one piece, 18 inches diameter, 2-inch tread and mounted on 1¼-inch square wrought-iron axle. This is designed for very severe use.

Detroit Barrow No. 1. For Green or Burnt Brick

Bottom 36 inches long. From bottom to end of handle 18½ inches. Outside to outside of handles at front 27 inches. Back 19 inches high, 21¼ inches wide. Height at leg 18 inches. Wheel 22 inches.

Made with wood-block journal bearing as shown, or with the steel roller bearing for $1.00 extra per barrow.

No. 4 Off-Bearing Truck

Unboxed weight about 120 pounds. Diameter of wheels 15 inches.
Extra charge for fitting with roller bearings $1.00 per truck.

A Gratifying Result from a Long-Distance Shipment

HONG KONG, CHINA.

Messrs. Chambers Bros. Co., Philadelphia, Pa., U. S. A.:

GENTLEMEN:—The brick machine you supplied us last year has now been working for several months and has made three million of bricks. Its working has been altogether satisfactory.

When we commenced operations, I took an intelligent coolie (laborer) and showed him how to regulate the supply of water, etc. In two days he was able to turn out material of uniform density, and after using up a dozen safety-pins everything went well.

One of the most satisfactory points about the installation is that the pugging is so perfect that only 15 per cent. of water is required to make a coherent brick. We expected 20 per cent. would be necessary. As this water has to be evaporated at a cost of so much coal, the 5 per cent. saved is a very important item.

The working out of every mechanical detail about your machines is admirable and a source of pleasure to me every time I see them.

The friction clutches justify all you write about them. They have completely overcome my prejudice against the substitution of a clutch for fast and loose pulleys.

There is every prospect of our enlarging our plant this year, and I hope shortly to indent for another mixer and brick machine.

Please receive herewith some views of our works, which may interest you. I am sorry that it is not possible to get another photograph of your brickmaking plant.

I remain, gentlemen,

Yours faithfully,

(Signed) W. H. HEWITT, *Engineer.*

Drying Stiff Molded Machine-Made Brick

Various methods of drying may be successfully employed under suitable conditions, but no one plan can be broadly designated as "the best," nor even followed in all cases simply because of its success in certain instances. Owing to the widely different action of various brickmaking materials, probably no part of the manufacturing process requires greater care, not only in selecting the method and apparatus for drying, but in its subsequent operation.

Open-Air Shed Drying

Auger machine-made brick being molded stiff permit piling on edge seven or more courses high direct from the machine and may be loaded on barrows and wheeled to drying sheds. These sheds are usually about 30 feet wide by 150 feet long, with double-pitched roof, every alternate board of which is loosely secured so that it can be turned over upon the adjacent one, and thus admit sun and air. Proper construction of this roof (for which we have working drawings) permits of quick and satisfactory closing of shed roof when needed.

From three to fifteen days are required in Philadelphia climate to dry bricks by the open-air method, which is one requiring the least amount of invested capital.

Rack and Pallet System

Brickmakers having yards equipped with what is termed the "Rack and Pallet System" may use the same to advantage for drying our machine bricks by placing bricks on edge on these pallets (usually eight bricks to each pallet), transferring them by either spring trucks or barrows to the racks, and then placing the loaded pallet in its position in the rack.

As the bricks are handled but once until ready to be set in the kiln for burning, and each stands on edge with no weight upon it, this, with the slow drying of the open-air system, usually produces satisfactory quality.

The Lift Car System for Open-Air Drying

This system has advantages over the use of barrows. It not only saves labor, but requires less handling of the brick and offers better drying conditions for the lower courses. The brick need not be handled after being hacked at the machine until they are delivered to the kiln-setters. This contributes to better quality as well as decreased cost.

Artificial Brick Dryers

Heat for drying brick artificially is obtained from many sources under different systems of manufacture—from the base of boiler stack connected with the power plant; from exhaust steam supplemented by some live steam; from cooling brick kilns of the down-draft type, and occasionally from the cooling open-top or Dutch kiln; from fuel burned expressly for drying purposes, either in a stoker furnace or a natural-draft furnace opening directly into the drying tunnels and discharging the soot and combustion gases directly in contact with the bricks, or used to heat the floor of a large room within which the bricks are left to stand either upon cars or directly in contact with the heated floor until dried to the desired degree.

Advocates and arguments in support of any of these methods are to be found, and occasionally the combination of two or more sources of supply appears under some circumstances a reasonable solution of the problem.

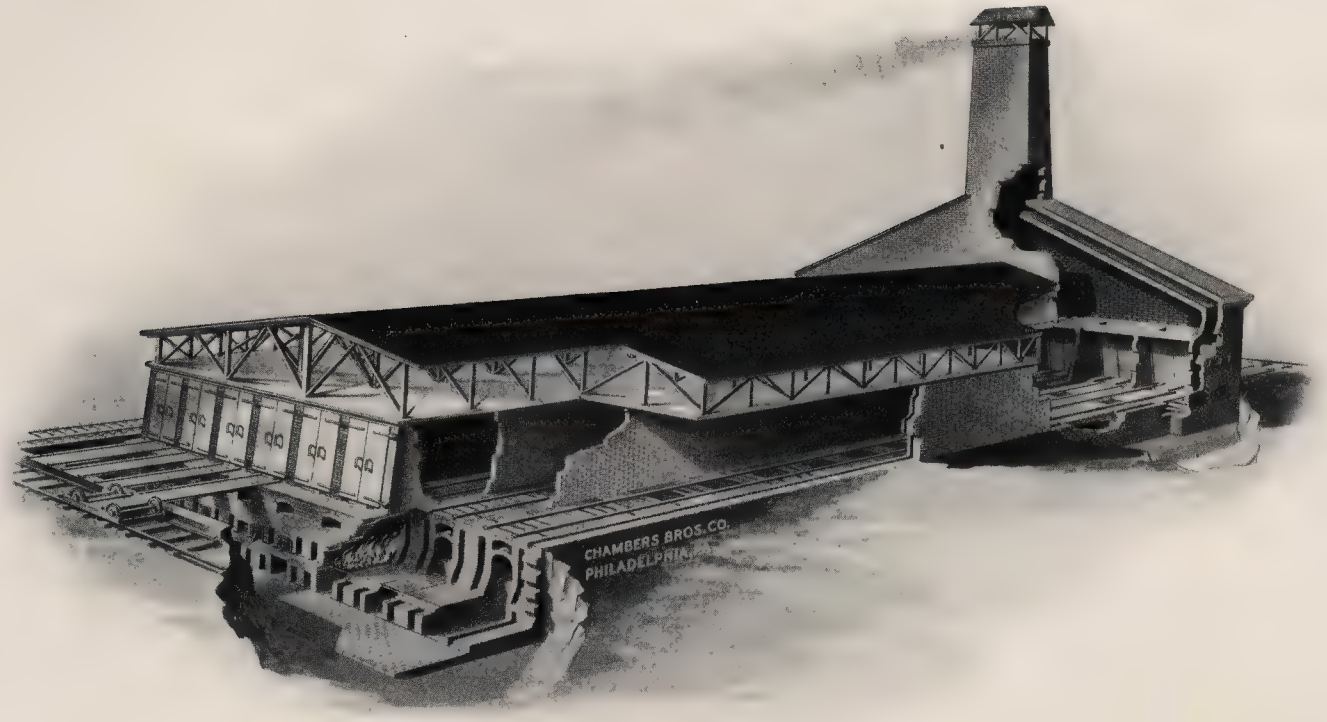
The cleanliness of a steam-heated dryer, together with its supposed safety within a wooden structure (formerly classed as cheap) appealed favorably to many, but the man on the job, who had the maintenance of several thousand feet of steam radiating pipes, with the accompanying joints and fittings, reported a different experience.

The slogan that "Heat from cooling kilns costs nothing" has not always proven true when leakage into the underground flues and ducts, or a hurry-up call for assistance upon a kiln still under fire, resulted in discharging into the dryer tunnels a lot of hot gases, which, in combination with the moisture from the green bricks, proceeded at once to "eat up the cars" and other metal equipment. Sometimes the too rapid withdrawal of heat from the burned kiln affected the quality of the burned product.

A brick dryer should be constructed of masonry and metal, no matter what the source of heat supply. Separate and independent control of the temperature and of the circulation of air passing through the drying tunnels is essential, and the apparatus and plan of construction must possess certain flexibility, permitting adjustment of these features to meet the varied requirements of different clays during the drying process. The temperature a green brick will stand, the rapidity with which its moisture may be safely removed, the color effect upon burned product as influenced by slow or quick drying are always problematical and cannot be determined by experiments with a few sample bricks. Expert judgment cannot give a rigid guarantee of dryer performance upon an untried material.

A recognition of these facts, together with regard for safety, permanence, convenience in cleaning flues, simplicity in construction and operation, economy in fuel consumption and adaptability to different clays have governed us in the design of our

Natural Draft Radiating Furnace Tunnel Dryer.

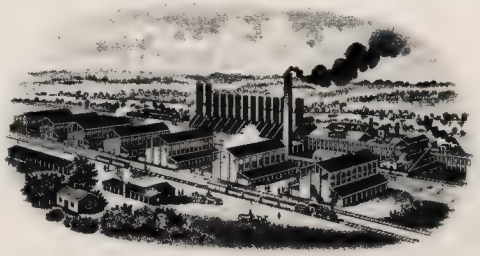


Natural Draft Radiating Furnace Brick Dryer

Usually built in units of 4, 6, 8 or 10 single-track tunnels to each stack.

Except in rare instances we recommend two independent stacks for a sixteen-track dryer, with single track to each tunnel.

James W. English, President. James W. English, Jr. Vice President. Harry L. English, Gen'l. Mgr.



Works at Chattahoochee, Ga., on Southern Railway.
Capacity 200,000 per day.

Chattahoochee Brick Company,

Railroad Builders

And Manufacturers of

Chattahoochee River Bricks,

Plain, Ornamental and Oil Pressed.

Office 701-4 Fourth National Bank Bldg.

Atlanta, Ga.

Messrs. Chambers Bros. Co., Philadelphia, Pa.:

GENTLEMEN:—I have before me your letter of August 1st, addressed to your Mr. Morrison, making inquiry regarding our new Direct Heat Dryer and results so far secured in the operation of same. By Mr. Morrison's request we are addressing you direct on the subject.

We constructed this dryer along the lines of your plans, and in accordance with your specifications, making but few minor changes. * * * We made personal inspection of some five or six different types of dryers in this section, and after these inspections decided that a dryer as covered by your plans and specifications was best adaptable to our purpose, and would be more economical in operation and securing the best results.

The best evidence of our experience with your steel brick-dryer cars is that we continue to duplicate our orders for same. * * *

We are contemplating the erection of a new dryer, and in this event shall build a duplicate of the one recently built from your plans, the only difference being that it will be of greater capacity.

Trusting that this is the information desired, I am,

Yours very truly,

General Manager.

Our Natural Draft Radiating Furnace Brick Dryer

No royalty charges.

No iron work of a complicated character.

Much of the metal work used in construction is obtainable from local shops.

Construction plans furnished customers purchasing metal work and car equipment from us.

A durable, economical brick dryer.

A safe one to leave at night.

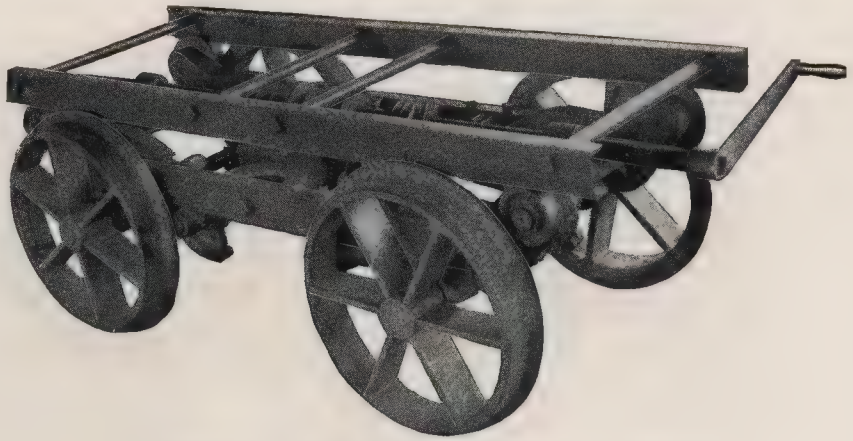
Each tunnel independent of the others. Easily cleaned and operated.

System of Drying Sheds with Canvas Covers for Ends and Outer Edges. Used with Ideal Lift Car and Transfer Car for Open-Air Drying

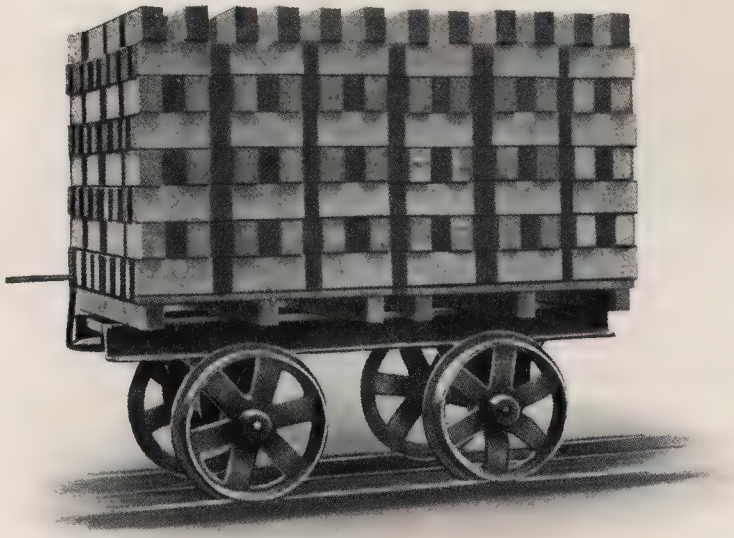
Two or more special hacking platforms are provided at the machine delivery belt upon which the loading pallets are placed. The bricks are hacked immediately upon these pallets, about 192 brick to each pallet, two of which constitute a car-load of 384 bricks. The lift car being pushed into position, the loaded pallets are quickly raised upon the car body and taken to the sheds where the operation is reversed, the load left upon the raised rails in the sheds, and car removed.

This apparatus for handling bricks in connection with a platform elevator, may be employed to utilize for drying or for storage purposes the space over a set of artificial drying tunnels and beneath the roof thereof.

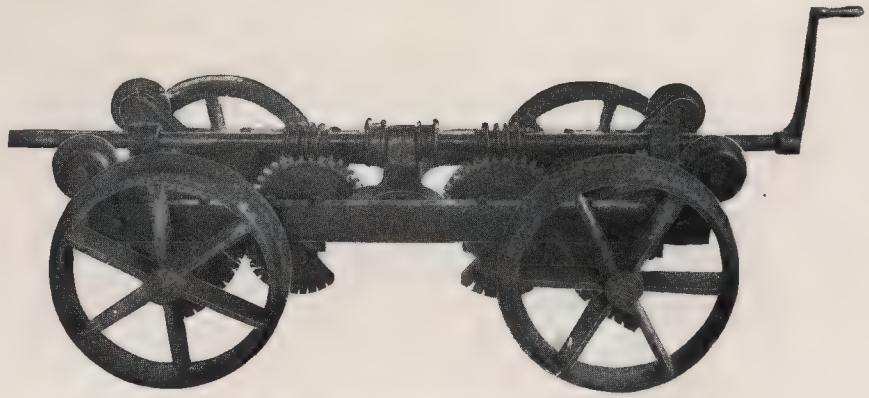
The rolling contact between the channel frame and the four wheels on lifting levers reduce friction and greatly reduce the labor of operation. Power being applied at four corners, the load is lifted level and without jar. Crank shaft 71 inches, pallet length 66 inches, width 30 inches. Gauge of track 24 inches. Height of lifting frame when at lowest point 19 inches, when elevated to highest point 23 inches. Unboxed weight complete car, exclusive of wooden pallets, about 800 pounds.



Ideal Car with Lifting Frame in Position

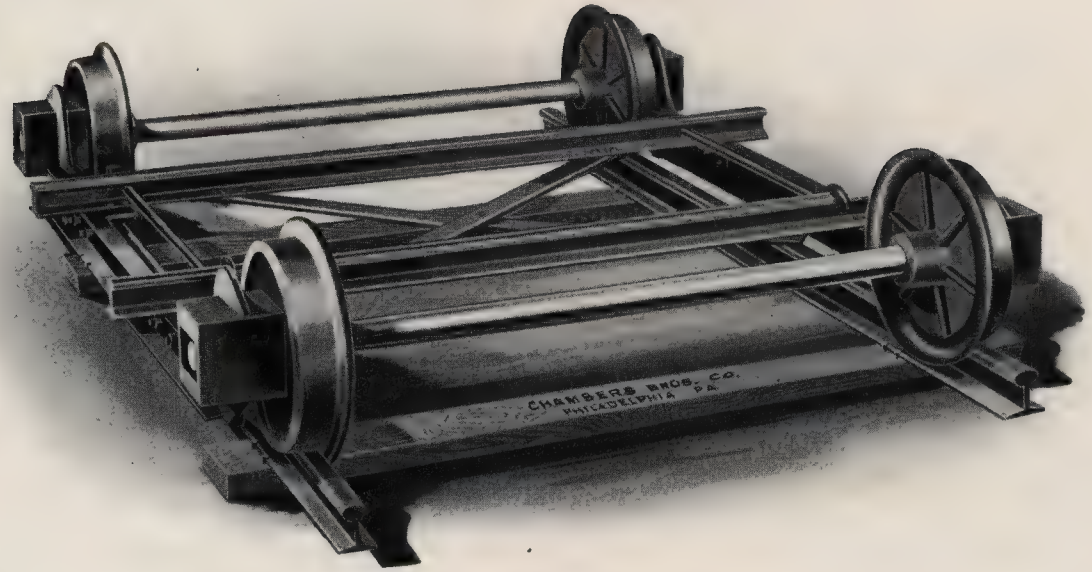


Ideal Lift Car with Customary Load of about 384 Bricks



The Ideal Brick Lift Car

With steel lifting frame removed to more clearly show the powerful worm, worm wheels and lifting mechanism. The crank may be applied at either end.



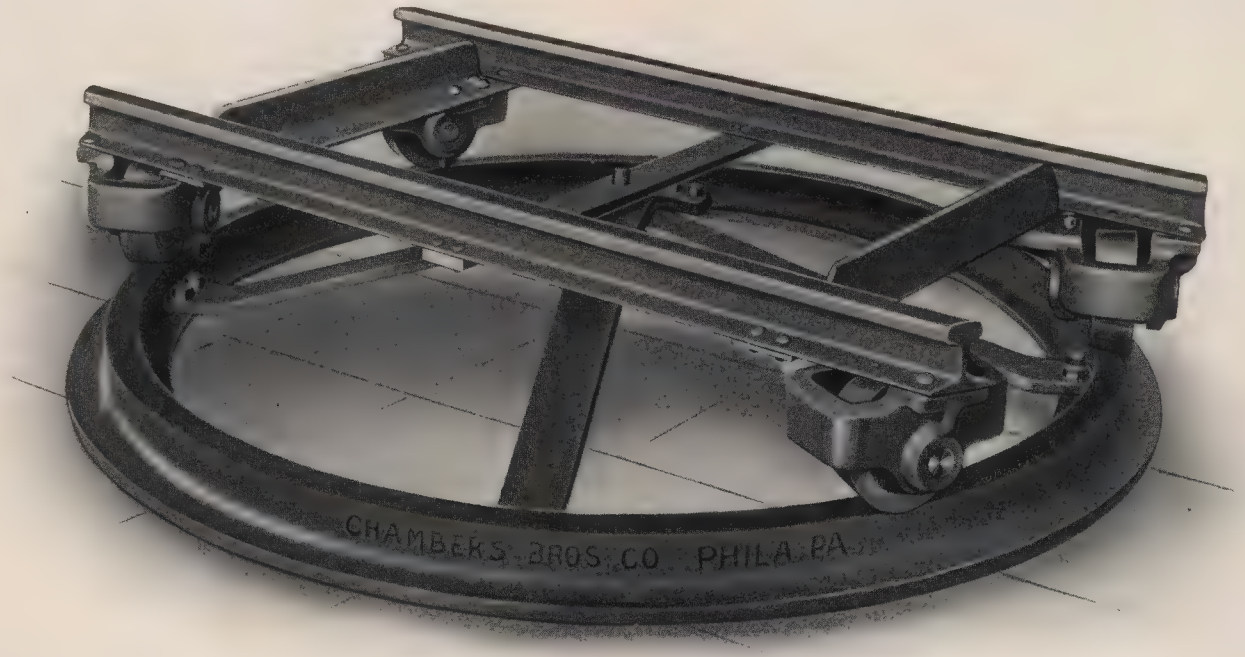
Steel Frame Transfer Car

Fourteen-inch diameter chilled wheels, on two-inch axles. Frame of steel beams with diagonal cross braces. Renewable journal bearings in grease-packed boxes. All fittings are forged. Cars are built to required gauge and dimensions.

Unboxed weight about 760 pounds.

Double Transfer Cars

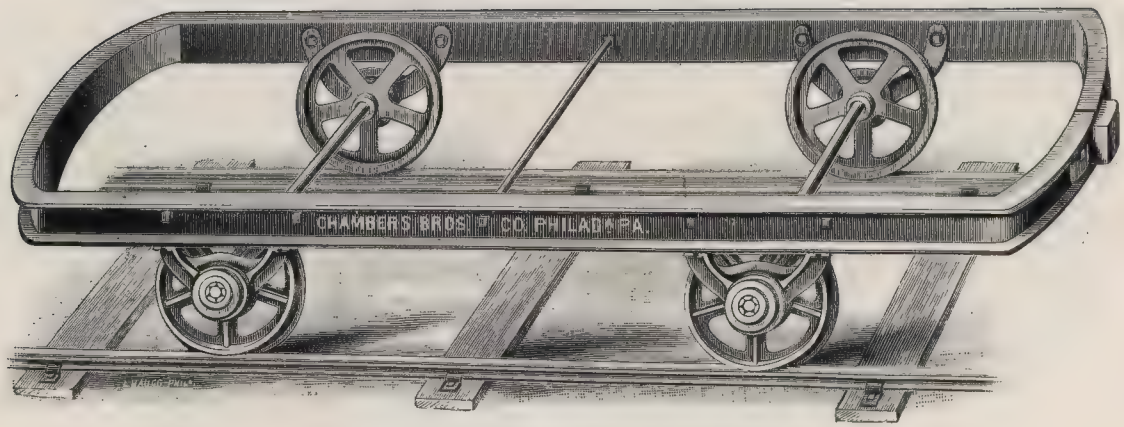
The frame is of 5-inch heavy section steel beam. Fourteen-inch diameter heavy plate pattern chilled wheels are used. Height from rail to rail cannot be less than 6½ inches. When built to run on gauge of 3 feet 8 inches, Drawing No. 81-C-39. Unboxed weight is about 850 pounds.



Heavy Pattern Iron Turntable No. 2

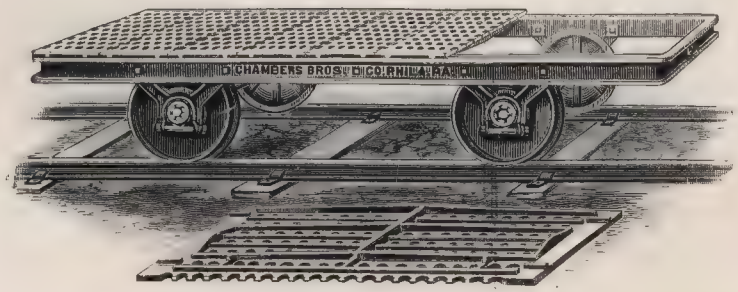
This table has a heavy iron base ring with wrought cross braces in which is mounted the centre pin. Rollers are turned to proper radius to suit diameter of ring. Heavy steel angles with 25 pound T rail riveted together are used. Ring diameter is 4 feet 8 inches, with 5-inch width of base. Rollers 6 inches diameter by 2 inches face. Rail 4 feet 7 inches long. Unboxed weight about 700 pounds.

Similar turntable of larger dimensions, Drawing No. 49-B-86, Weight about 900 pounds.



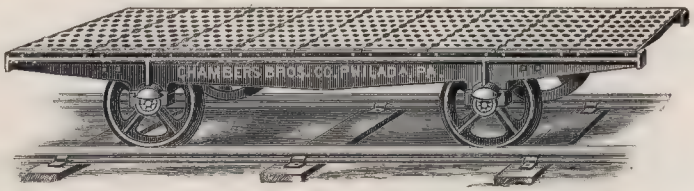
Steel Channel Frame Car No. 1

Car body formed of one piece of 4-inch steel channel, bent to shape with ends secured by substantial clip bumper. Body provided with centre tie rod or angle brace. Either 12 or 14-inch diameter wheels are used. Cars fitted with roller bearings. Car body of different dimensions with corresponding variations in weights.



Steel Channel Body Car No. 2

Has 4-inch steel channel body, with 14-inch diameter wheels. Full cage roller bearings. Single deck composed of nine cast-iron perforated plates, heavily ribbed upon the under side. Standard deck dimensions 31 by 92 inches. Unboxed weight about 645 pounds.



Single Deck Platform Car No. 9

A perforated iron-top car with cast-iron frame. It is provided with nine perforated 31-inch slats, thus making a platform 31 inches wide by 92 inches long.

Has 12-inch diameter wheels on 1½-inch axles. Full cage roller journals. Unboxed weight for car of above dimensions about 560 pounds.

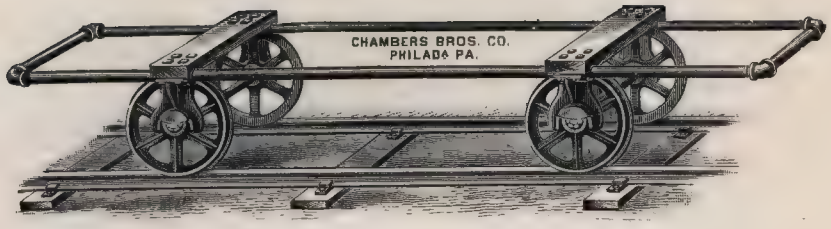
Steel Channel Body Car No. 3

Has 4-inch channel body. Fourteen-inch diameter wheels on 1½-inch axles. Full cage roller bearings. Three pairs of wrought posts. Unboxed weight without decks about 520 pounds. Body 92 inches long by 31 inches wide.

Single Deck Car No. 3 B

Body of 3 by 4-inch steel angles. Length 92 inches, outside width 34 inches when built for 22½ gauge of track. Length, width and gauge can be made to suit customers' requirements. End and middle cross rails of rolled steel forged to shape. Fourteen-inch diameter wheels on 1½-inch axles. Full cage roller bearings.

Unboxed weight without deck about 400 pounds.

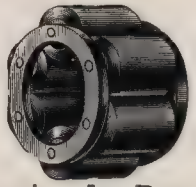


Pipe-Body Dryer Car No. 4

Twelve-inch diameter wheels on 1½-inch axles. Full cage roller bearings. Body dimensions made to order.

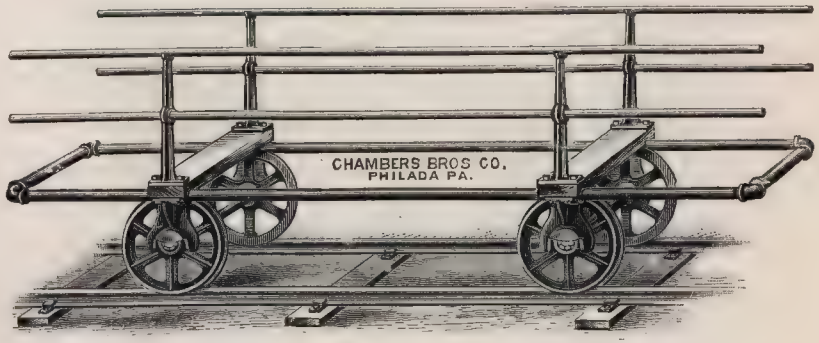
Chambers' Pallet Car No. 13

This is a cast-iron car, 40 inches in width by 70 inches in length. It is used in connection with pallets when it is desired to place the pallets lengthwise on the cars. Unboxed weight about 375 pounds.



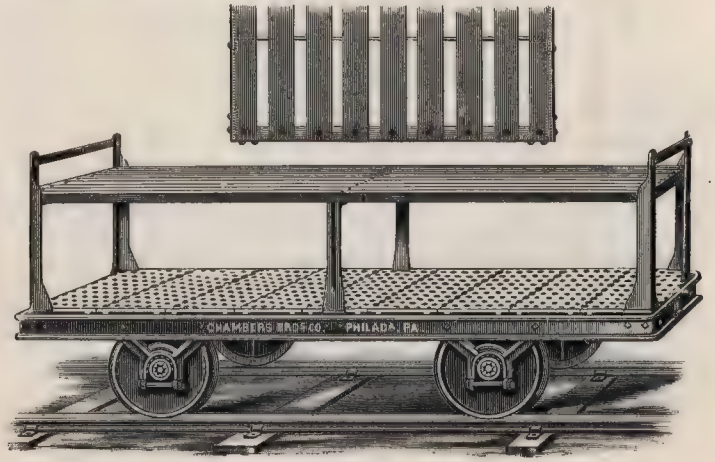
Cage Roller Bearing for Dryer Car Journals

Six iron rollers held in place by two malleable rings. Each roller revolves upon its own spindle.



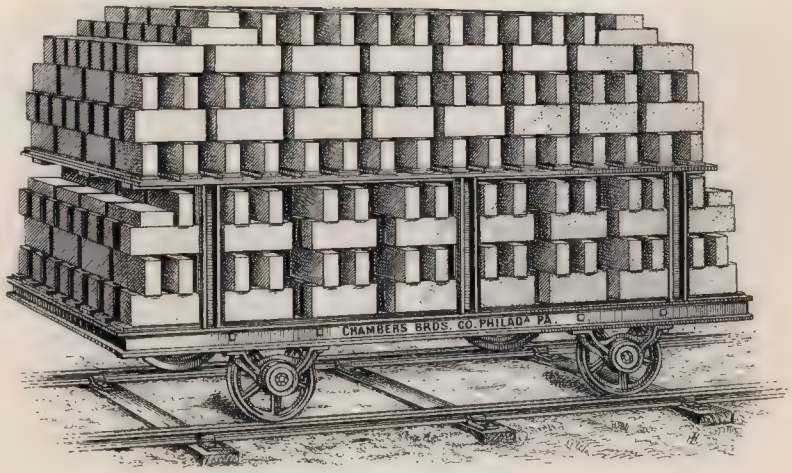
Triple or Double-Deck Pipe-Body Dryer Car No. 5

This car is the same as No. 4, with the addition of cast-iron corner-posts or standards and pipe-rails, permitting of the addition of two additional decks or platforms. It is capable of carrying a very large number of small pieces of clay wares.



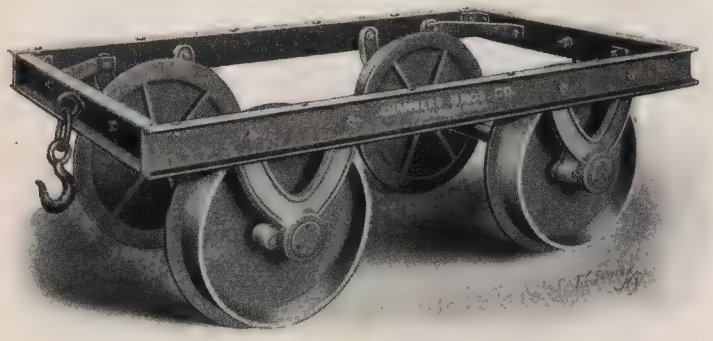
Double-Deck Car No. 11

This is our No. 2 steel channel body dryer-car, supplied with cast-iron corner and middle posts, and an upper deck of 2-inch flat iron riveted to a well-braced angle-iron frame.



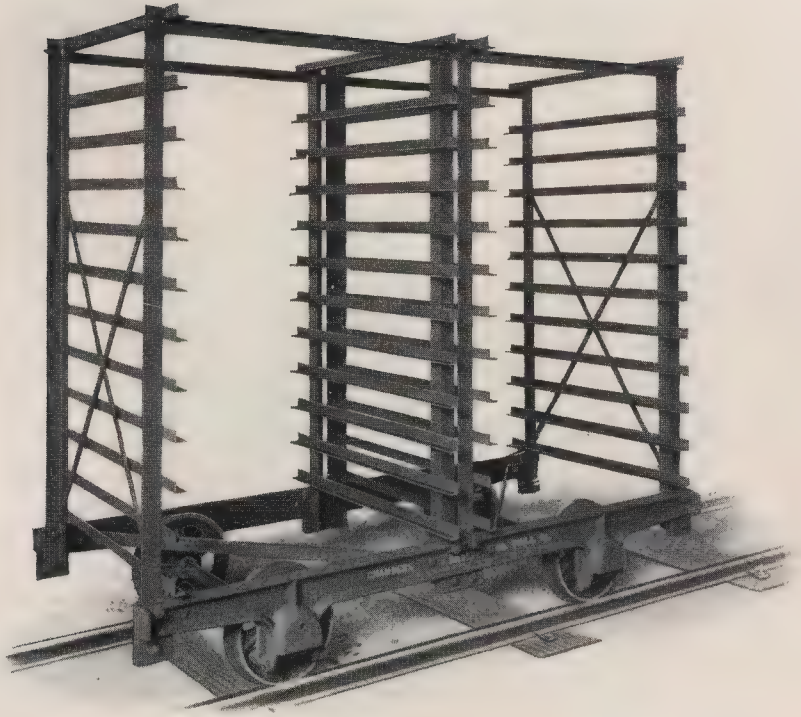
Steel Channel-Frame Double-Deck Brick Car

Showing a common method of hacking brick on cars of this type.



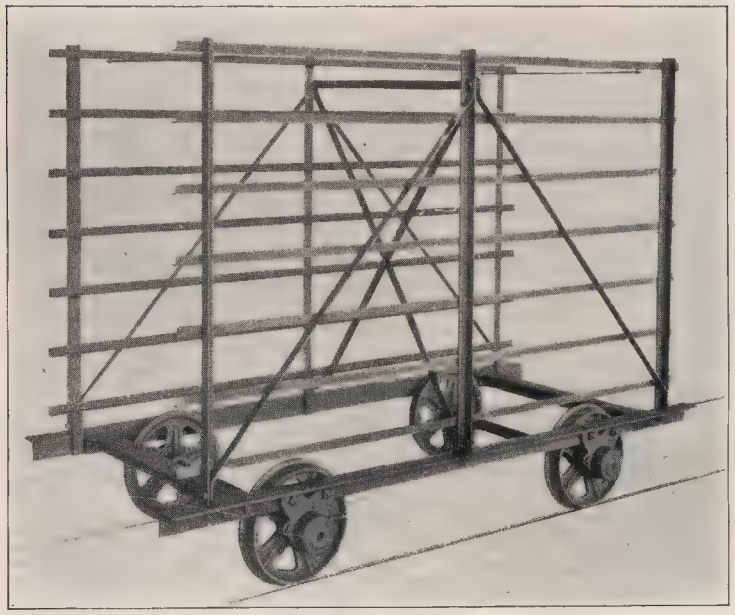
Car No. 18

A good, strong general-purpose car, having 4-inch steel channel body, well braced and riveted. Axles 2 inches diameter, with steel roller bearings. Broad-tread flanged wheels 18 inches diameter may be used on wooden or on iron rails. Weight 700 pounds.



Steel Angle Rack Car No. 14

A very stiff, rigid rack car for metal or wooden pallets without legs, with rack made of angle iron cross braced at each end. Similar car is also made with angle side frames of steel.



Steel Angle Rack Car No. 16

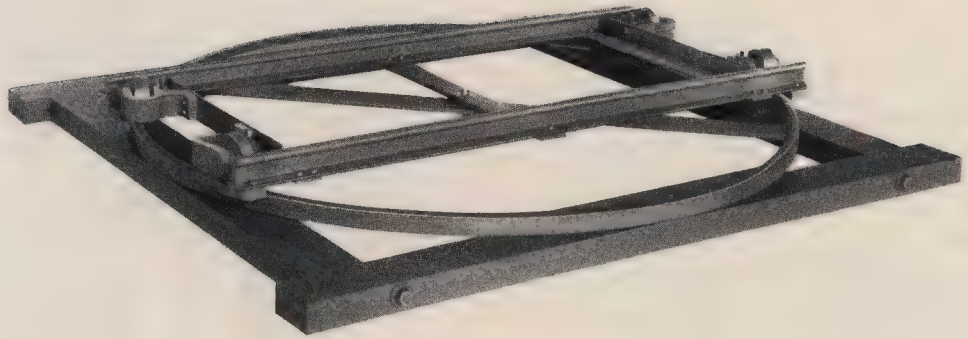
Has 12-inch diameter wheels, 1½-inch axles with steel roller bearings. Side frames and racks made of rolled angles riveted and thoroughly well braced. The pallets or boards are loaded from either end of the car. Adapted to clay wares of various sizes and shapes.

Rack Car No. 20

We make various patterns of steel-rack cars mounted on roller-bearing casters. Length, width, height and number of racks or space between racks desired should accompany inquiries for price.

Rack Car No. 21

Cars for special purposes designed to order.

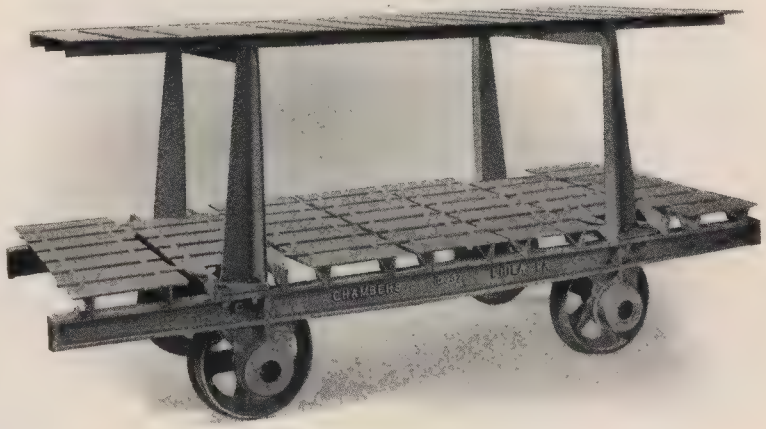


Iron Portable Turntable

This table is made so that it can be easily lifted apart, thus enabling two men to readily move it from one kiln to another.

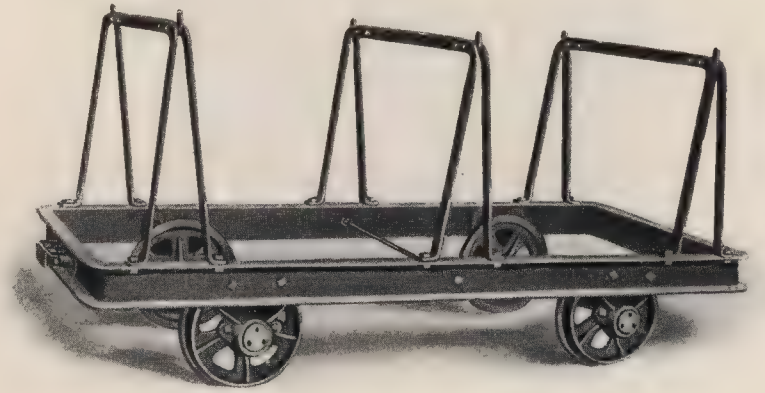
It is constructed principally of wrought iron or steel, the different parts being securely riveted, and the whole designed to stand the rough handling of brickyard use.

The upper section turns upon a wrought-iron ring, the four rollers being turned upon the face and located close under the load to be carried. It is a very easy-working turntable, and is guaranteed satisfactory.



Double-Deck Car No. 12

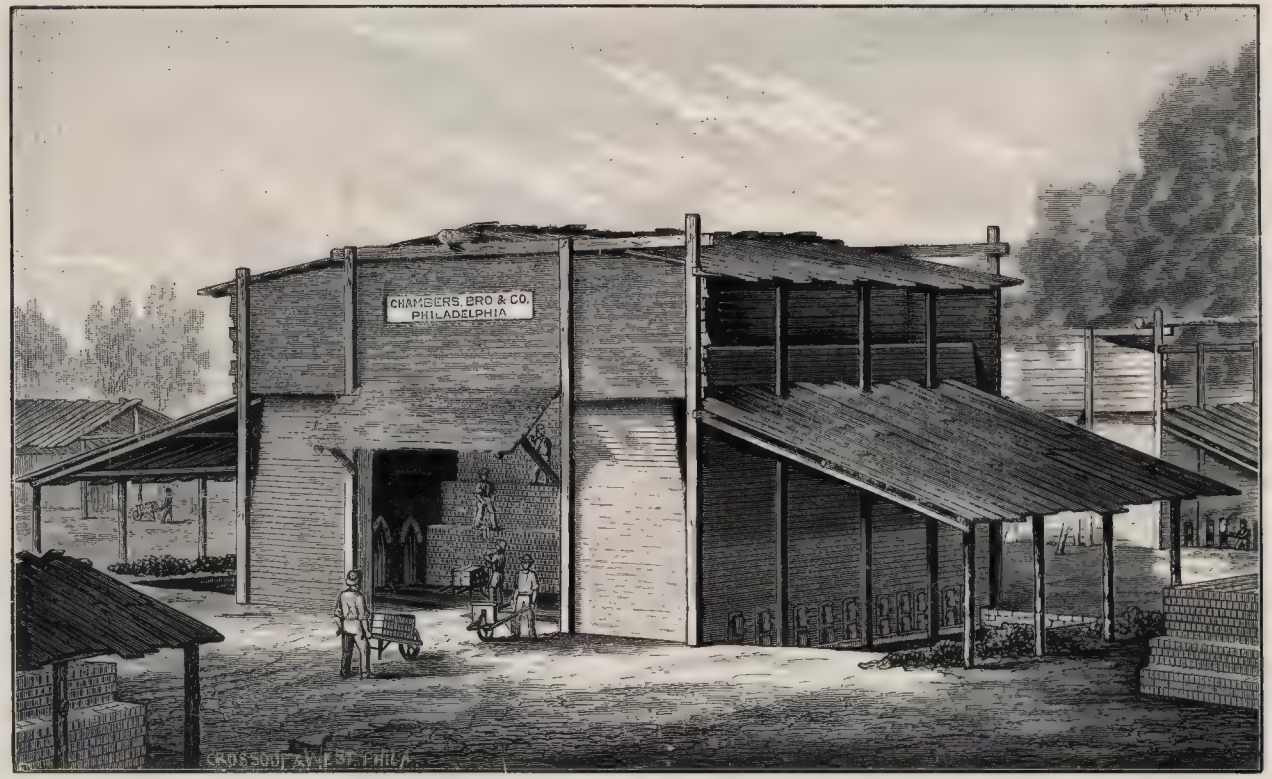
Lower deck of cast-iron pallets, each of size to fully cover the edge surface of a paving block. Upper deck of 4-inch steel slats riveted to three steel angles. Designed for a manufacturer of street pavers.



Steel Channel-Frame Car No. 17

Provided with three pairs of posts for support of upper deck, and designed for use with wooden or metal decks.

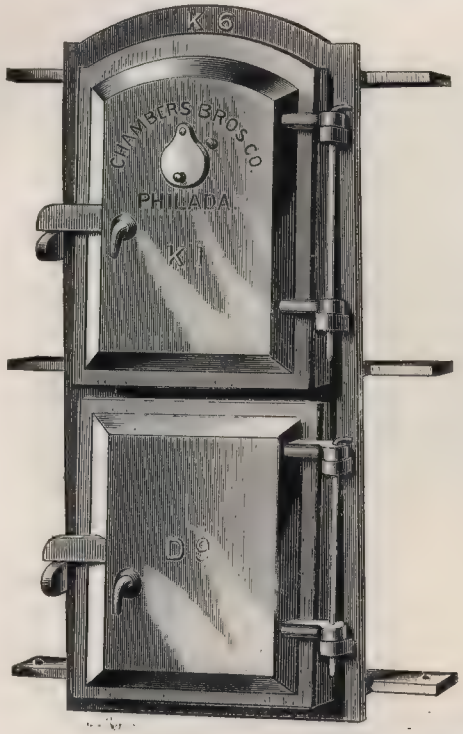
Kiln Castings
and
Tools



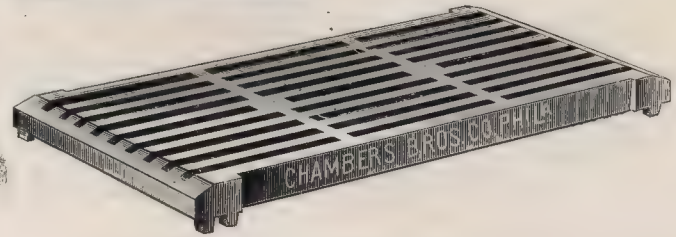
Ten-Arch Open-Top Coal-Burning Brick Kiln

Usual capacity 180,000 to 200,000 building bricks.

Kiln Irons for Open-Top Coal-Burning Kilns



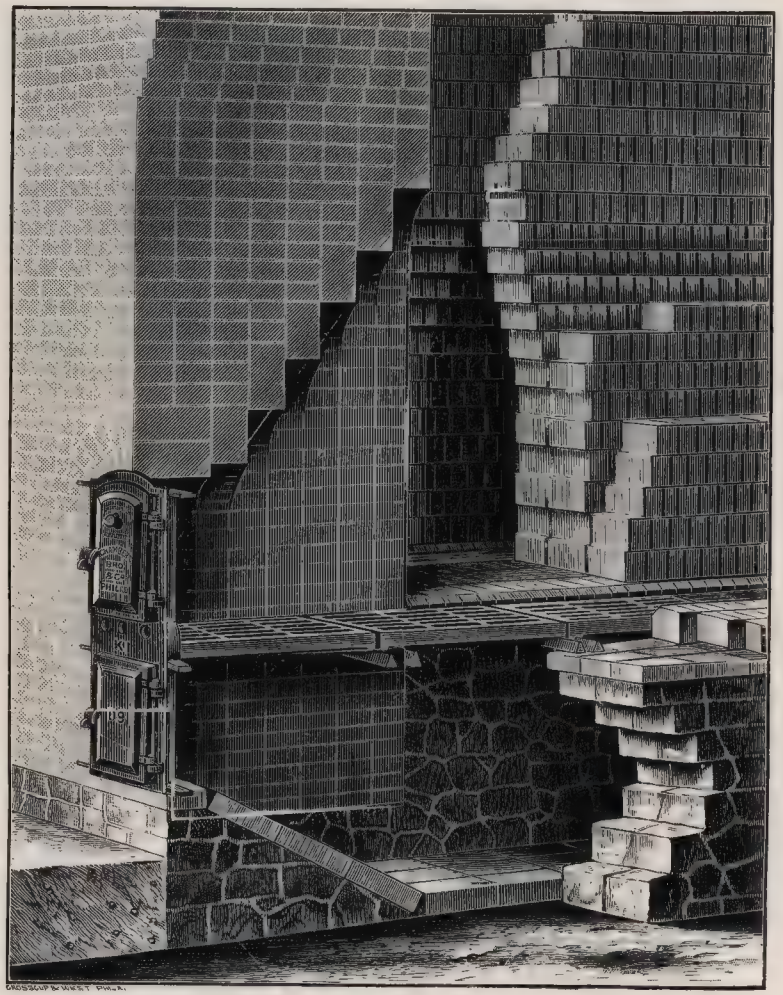
Kiln Frame K6, with fire and ash-pit doors is in general use on kilns of this type. Frame is 14 inches wide by 33½ inches high to top of arched head. Total weight of frame and doors unboxed is about 120 pounds.



Ten-Bar Beveled-End Kiln Grate

Weight about 50 pounds.

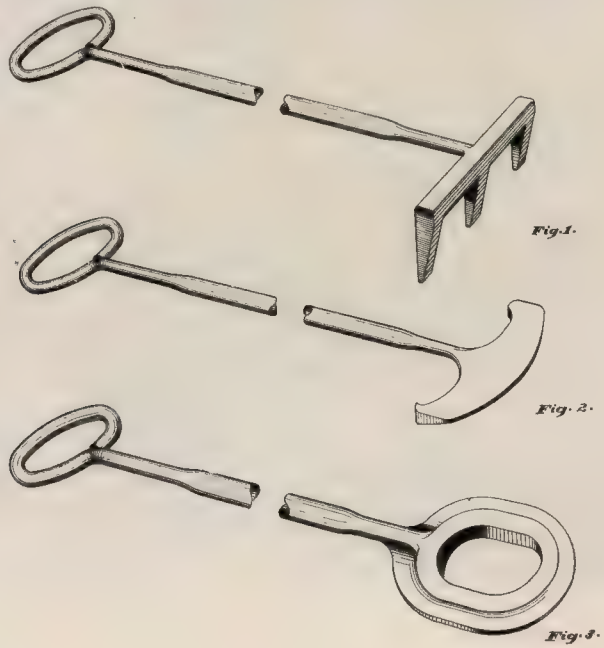
Kiln Grates 12 inches wide by 24 inches long and made with 9, 10 or 12 bars giving different widths of air space.

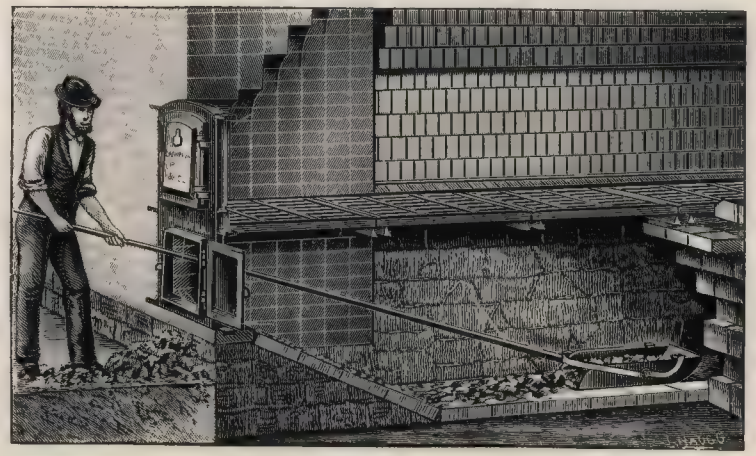


Kiln Tools for Open-Top Coal-Burning Kilns

We are prepared to furnish kiln tools of all kinds, spades, rakes, hoes, harpoons or slash bars, and show below an improved swinging ash scoop.

When being pushed into the ash pit, the scoop rides over the ashes, and when withdrawn always brings out a full load. We also supply plain ash scoops open at both ends and ironed to receive wooden handles.



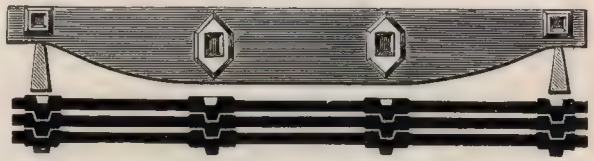


Method of Removing the Ashes from Coal-Burning Kiln

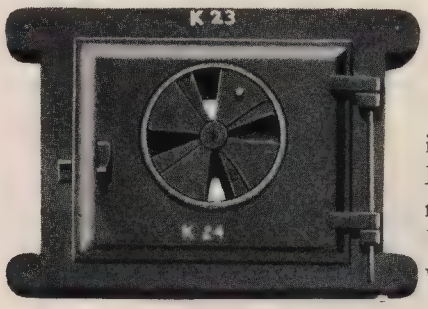
A complete set of kiln tools for Open-Top Kiln comprises an ash scoop, as mentioned above, and the following:

1 Rake, Fig. 1, with pipe handle 18 feet long.
1 Rake, Fig. 1, with pipe handle 12 feet long.
1 Harpoon, Fig. 2, with pipe handle 18 feet long.
1 Harpoon, Fig. 2, with pipe handle 12 feet long.
1 Slash Bar, Fig. 3, with pipe handle 12 feet long.

Castings for Kilns Having Outside Furnaces

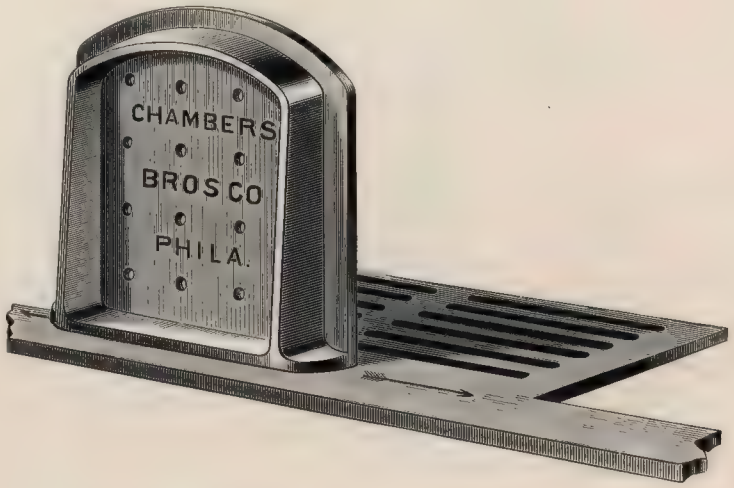


Single and Double Grate Bars of various lengths and weights.

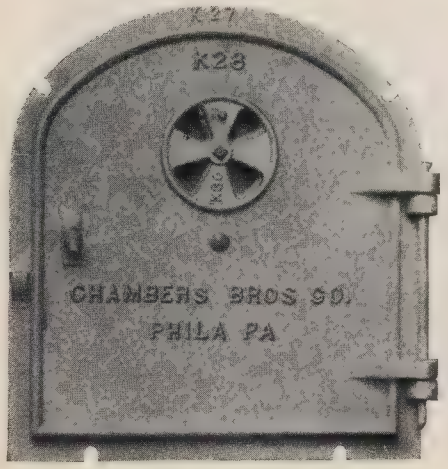


Pattern K 23, K 24
Fire Door and Frame

Inside measurement of frame 15 inches wide by 11½ inches high. Frame is flat and secured by anchor rods through the four corner lugs. Weight of frame and door with wicket, complete, about 50 pounds.



Sliding Furnace Door, Weight About 60 lbs.
Furnace Sill Plate, Weight About 90 lbs.



Fire Door and Frame Without Ash-Pit Door,
Pattern K 27, K 28

Inside measurement of frame 14 inches wide by 16 inches high. Has an iron liner or fire plate secured to inside of door. Frame has a flange 3 inches deep that projects into the kiln wall. Weight of frame, door, fireplace and wicket, complete, about 110 pounds.

Two Styles of Frame and Door Used on Wood-Burning Kilns

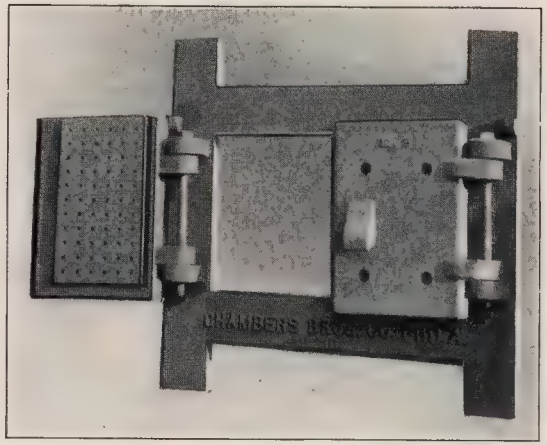
Inside measurement of frame 12 inches wide by about 14 inches high to top of arch.

Unboxed weight of frame and door about 130 pounds.

Castings for Muffle Kilns

We have complete sets of patterns for cast-iron work used in the construction of muffle kilns as generally used by pottery manufacturers. The main frame shown here has opening 2 feet 9 inches wide by 7 feet 10 inches high.

Weight about 1,000 pounds.



Fire Frame K 16 and Doors for Muffle Kiln K 14 and K 15

The doors have removable cast-iron perforated fire plates, or may be fitted with fire brick. Opening in frame is 15 inches wide by 9 inches high.

Weight of frame with two doors and fire plates about 110 pounds.

Quality of Product from the Chambers Auger Machine

Its Use for Briquetting Purposes

In addition to their use for the manufacture of building and street paving brick and block and for hollow clay blocks our Auger Machines are employed in compressing argillaceous ones, flue dust with other fine and waste products connected with the smelting of copper ores, etc. For briquetting low-grade fuels and in some processes of cement manufacture.

Several shipments of our machinery in connection with smelting operations have been made to the Anaconda Copper Mining Co., Montana; the Boston and Montana Consolidated Copper and Silver Mining Co., Montana; the Britannia Smelting Co., British Columbia; the Great Cobar Co., New South Wales; the Mount Morgan Gold Mining Co., Australia.

Characteristics of Bricks Made by the Chambers Auger Machines

One result of the fact that during the time it is being compressed in our machine the clay is kept constantly in motion, the particles so arrange themselves as to produce a most solid, compact bar. The smaller particles are arranged between those of larger size and this is so universally the case that a fine-grained, smooth surface is formed from comparatively coarse material. This is in itself a factor of strength in the brick or briquette produced. The brick are less absorbent than when molded by other processes, are stronger and will stand greater crushing strains.

Selecting and Testing Clays

Selecting Clays

Too much care cannot be taken in selecting clay. Without suitable materials it will be impossible to make a good quality of bricks by any process or machinery. Materials of quicksand nature holding so much water that when pugged they become soft are not suitable for the auger machine process. With this exception nearly any material that can be molded with the aid of water can be handled by some of our machines. Some materials worked have only 20 per cent. of clay.

Clay Tests

While an actual working test of clay on a full-sized machine is not always necessary, we consider this the safest course, and, as a rule, prefer to make such tests at our works before executing orders for brick machines. We keep machines under belt for the express purpose of making tests and obtaining samples of product for customer's approval. From three to four barrels of the material to be worked are required, and this should represent, so far as possible, the average run of the clay bank, and not simply one strata only. This must be shipped to us, freight prepaid, and should bear customer's name in addition to our address. A charge is made for tests, the amount paid, however, being refunded to purchasers of our machinery.

Warranty of Chambers Machinery

With comparatively few exceptions customers may order Chambers machines of standard pattern with the privilege of a reasonable trial period. The contract for sale will provide that in event of failure machines so ordered may be returned to us under certain conditions.

Our machinery is offered in good faith, based on the information as to requirements and conditions of use we have at time of order, but, aside from the privilege accorded customers as cited, we assume no other liability in event of failure of a machine to meet our expectations.

Should any individual piece of machinery prove to be defective in material or workmanship to an extent affecting its usefulness, we will supply a duplicate part in exchange f. o. b. Philadelphia without charge, we reserving the option of requiring the defective part returned to our works, freight at our expense. This liability expires in one year from date of initial shipment.

Data From Various Sources

Dimensions of Building Bricks

The dimensions adopted by the National Brick Manufacturers' Association for a standard hard-burned common building brick are 8¼ x 4 x 2¼ inches, and for a pressed front brick 8⅜ x 4 x 2⅜ inches.

The standard for the city of Chicago as adopted by union agreement is 8 x 3⅞ x 2¼ inches.

Proportions of Street Paving Bricks and Blocks

The proportions of paving bricks are shown to be of greater importance in resisting power to blows and strains than the actual size. Large size and faulty proportions will produce a brick more likely to fail in use.

Dimensions Noted from Different Localities

Galesburg, Ill., paving bricks, 8 x 4 x 2½ inches; paving blocks, 8 x 4 x 3½ inches.

Canton, Ohio, paving bricks, 8½ x 4 x 2½ inches; paving blocks, 8½ x 4 x 3½ inches.

Haydenville, Ohio, brick, 8 x 4 x 2⅜ inches.

New Cumberland, W. Va., brick, 8 x 4 x 2⅜ inches.

Sciotoville, Ohio, brick, 8 x 4 x 2½ inches.

Perkiomen, Pa., brick, 8 x 4 x 2½ inches.

Analysis of Shale from which a Good Paving Brick is being Manufactured on Chambers Machines

	Per cent.		Per cent.
Silica	58.55	Magnesia	1.64
Alumina	17.29	Soda	4.35
Oxide of iron	6.35	Potash	2.55
Water (combined)	5.41	Moisture (free)	0.87
Lime	0.53		

Quantity of Water Required for Brick Works

A stiff-mud brick plant making 50,000 bricks daily and using steam power should be provided with water supply of about 45 gallons per minute. For a plant of 100,000 daily capacity probably 70 gallons per minute will be found sufficient.

Table of Strength for Single Brick

From tests of Chambers Auger Machine Bricks conducted for Commissioners for Erection of Public Building.

Page.	Manufacturer.	Quality.	Make.	Total Load Applied.	Crushing Force in Pounds per Square Inch.	Area of Sample in Inches.	Remarks.	Number of Experiment.
7	Dobbins.	Hard.	Machine.	288,500	8,610	33.50	Failure gradually took place.	2559
21	"	"	"	411,000	11,720	35.07	Failed rapidly near close of test.	2587
22	"	"	"	304,000	9,210	33.00	Ultimate strength.	2588
9	Dotterer.	Pressed.	"	256,500	7,770	33.03	" "	2562
25	"	"	"	304,000	9,050	33.60	" "	2595
26	"	"	"	243,000	7,210	33.70	" "	2596

Tests to show the crushing strength of brick piers constructed of Chambers Auger Machine made bricks laid in both lime mortar and in cement mortar, the test piers having an area of about 160 square inches, resulted as follows:

Abstract of Average Strengths

In lime mortar. *First crack,* 864.23 pounds square inch, or 62,226 tons square foot.

In cement mortar. *First crack,* 1567.56 pounds square inch, or 112,864 tons square foot.

In lime mortar. *Ultimate strength,* 1372 pounds square inch, or 99 tons square foot.

In cement mortar. *Ultimate strength,* 2141.4 pounds square inch, or 154.18 tons square foot.

Data from Tests of Building Bricks

Made on Chambers End-cut Auger Machine and from the Spring City, Pa., Works of Mr. James Florey

Conducted by the Henry S. Spackman Engineering Co., Philadelphia.

CROSS BREAKING by placing brick on knife edges 7 inches apart and crushing with another knife edge on the face of the brick midway of this distance.	**From** Kiln No. 8—No. 1C, 2C, 3C " " 7— " 1C, 2C, 3C " " 6— " 1A, 2B Dutch Kilns Nos. 2 and 3 Total 10 Bricks	**Modulus of Rupture** Average **1194.2 lbs.**	**Requirements** of Building Code of City of Philadelphia **450 lbs.** not less than **350 lbs.**	**Percentage** of maximum requirement obtained **265%**
COMPRESSION TEST by bedding the surface of half brick in lime mortar, with thick wads of newspaper under and over, the brick first thoroughly dried.	**From** Kiln No. 8—No. 1B, 2B, 3B " " 7— " 2B Dutch Kiln No. 1 Total 5 Half Bricks	**Failed at lbs.** per sq. in. Average **3706 lbs.**	**Requirements** of Building Code of City of Philadelphia **3,000 lbs.** not less than **2,500 lbs.**	**Percentage** of maximum requirement obtained **123.5%**
COMPRESSION TEST on half bricks previously cross broken as per original method.	**From** Kiln No. 8—No. 1C, 2C, 3C " " 7— " 1C, 2C, 3C " " 6— " 1A, 2B Dutch Kilns Nos. 2 and 3 Total 10 Half Bricks	**Failed at lbs.** per sq. in. Average **3506 lbs.**	**Requirements** of Building Code of City of Philadelphia **3,000 lbs.** not less than **2,500 lbs.**	**Percentage** of maximum requirement obtained **116.9%**
ABSORPTION TEST by drying 48 hours and taking weight and then immersion 48 hours and taking weight.	**From** Kiln No. 8—No. 1A, 2A, 3A Total 3 Bricks	**Absorption** Average **10.27%**	**Allowed** by Building Code of City of Philadelphia **15%** not exceeding **20%**	
ABSORPTION TEST on half bricks previously cross broken.	**From** Kiln No. 8—No. 1C, 3C " " 7— " 2C " " 6— " 1A Dutch Kiln No. 2 Total 5 Half Bricks	**Absorption** Average **10.3%**	**Original Compression** Strength Average **3,111 lbs.**	**Loss** on Compression Strength **10.8%**
			After Absorption Compression Strength **2,775 lbs.**	**Allowed** by Building Code of City of Philadelphia **33 1/3%**
FREEZING AND THAWING on 5 half bricks previously cross broken.	**From** Kiln No. 8—No. 2C " " 7— " 1C, 3C " " 6— " 2B Dutch Kiln No. 3 Total 5 Half Bricks	**Loss** in weight after 10 freezings and 10 thawings Average **2.07%**	**Original Compression** Strength Average **3,901 lbs.** per sq. inch	**Loss** on Compression Strength Average **21.10%**
			After Freezing Test Compression Strength Average **3,078 lbs.** per sq. inch	**Allowed** by Building Code of City of Philadelphia **33 1/3%**

Chambers Brothers Co.'s Machine Works—Fifty-third Street Side

Our Factory

We have erected and fitted an establishment expressly for the manufacture of machines of our invention, and shall be pleased to receive visits from our customers or those interested in using machinery in our line. Our works are located in the western part of the city, at the corner of Fifty-second and Media Streets, being two blocks south from Fifty-second Street Station on the Pennsylvania Railroad, and may be reached by train in about ten minutes, or thirty minutes by Market Street Subway from the business centre. We have here our main office, with well-equipped drawing rooms, a complete pattern and wood-working department, machine shop, forge and foundry.

We are equipped with many tools designed expressly for our work, a private electric-light plant, and ample room and facilities for serving our patrons in the best possible manner.

West End—Media Street Erecting Shop

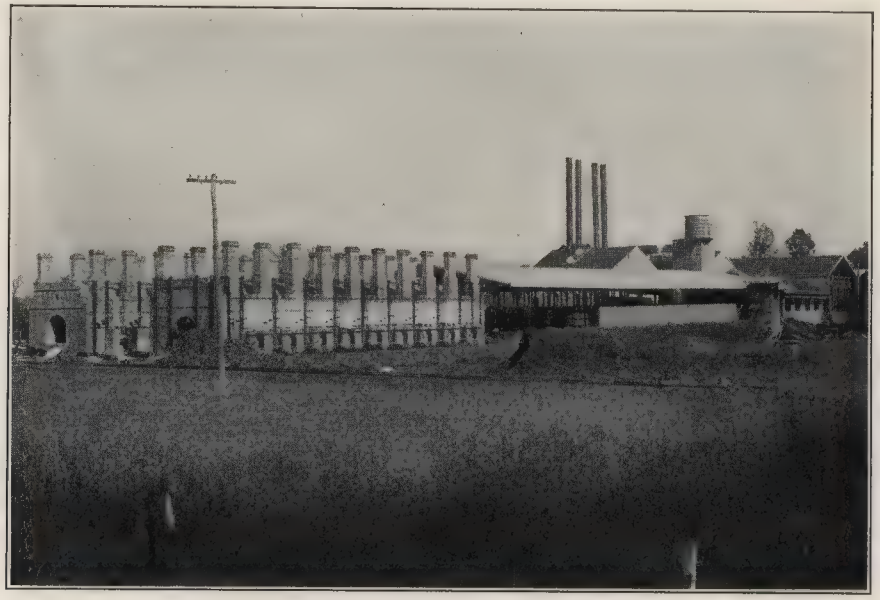
First Floor of Tool Shop, Fifty-second Street

East End of Erecting Floor, Media Street Shop

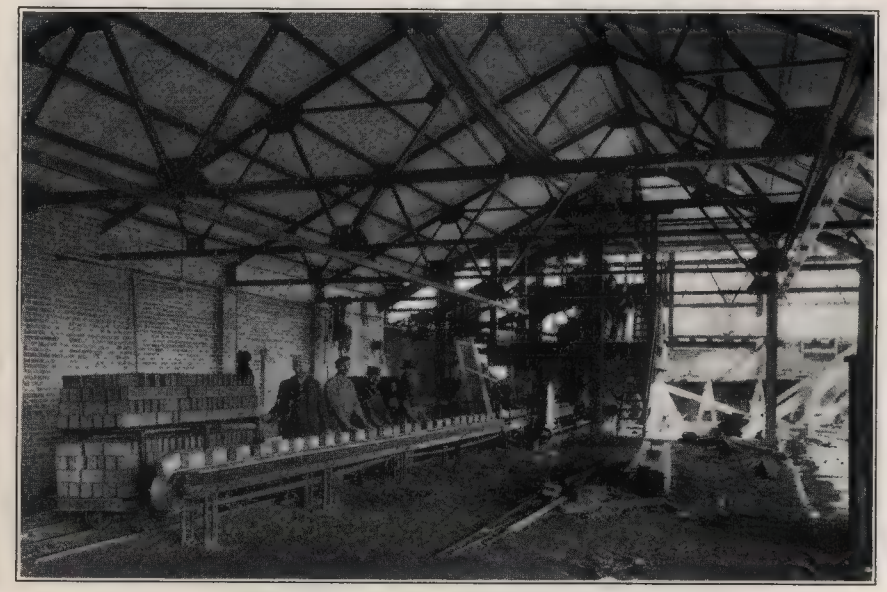
A Shop Line of Keystone Represses

Brick Works Plans

We have planned the arrangement of machinery for some of the most successful plants engaged in the manufacture of building brick, and offer our facilities for this work to our customers. We also make general yard plans showing proper location of buildings, kilns, sheds, etc., and frequently rearrange old works to handle the produce to better advantage, incorporating improved methods while giving due consideration to the value of existing equipment. The accompanying plates are suggestions of some of our work in this direction. Our preference is to study local conditions in each case and make special plans for each outfit.



View During Construction of Plant of 100,000 Daily Capacity



Views from a Modern Factory for the Manufacture of Building Brick

The clay storage shed with steel trussed roof is kept supplied with clay. Provision is made to feed the Granulator from the stored supply, so that the *manufacture of brick* may be independent of weather conditions.

Brick walls with steel trussed roof make a most admirable building for the business. A factory producing upwards of 100,000 bricks daily is worthy of a roomy, light, well-ventilated work shop.

Clay dump cars may sometimes be brought by gravity from the clay bank to the foot of inclined track leading to machine house.

In this case a Chambers Geared Friction Hoist with electric motor drive is mounted upon a transfer truck, thus providing a convenient means of shifting to any of several possible positions within a large clay storage house.

Views from a Modern Factory for the Manufacture of Building Brick

Electric lights are available when needed and all distantly located or isolated machines, such as blowers and vapor exhaust fans, are driven by independent electric motors. Both down-draft and continuous kilns are used.

The Artificial Brick Dryer, using heat from cooling kilns, is constructed of steel and brick with concrete ceiling. The manager rests easy, knowing that "a fire in the dryer" won't destroy his brick plant overnight.

Chambers Brick Machine History

So far as known, it is the first successful Auger Machine with an automatic cutter.

For fifty years the Chambers Brick Machine in various forms has been on the market, and there are large numbers in use.

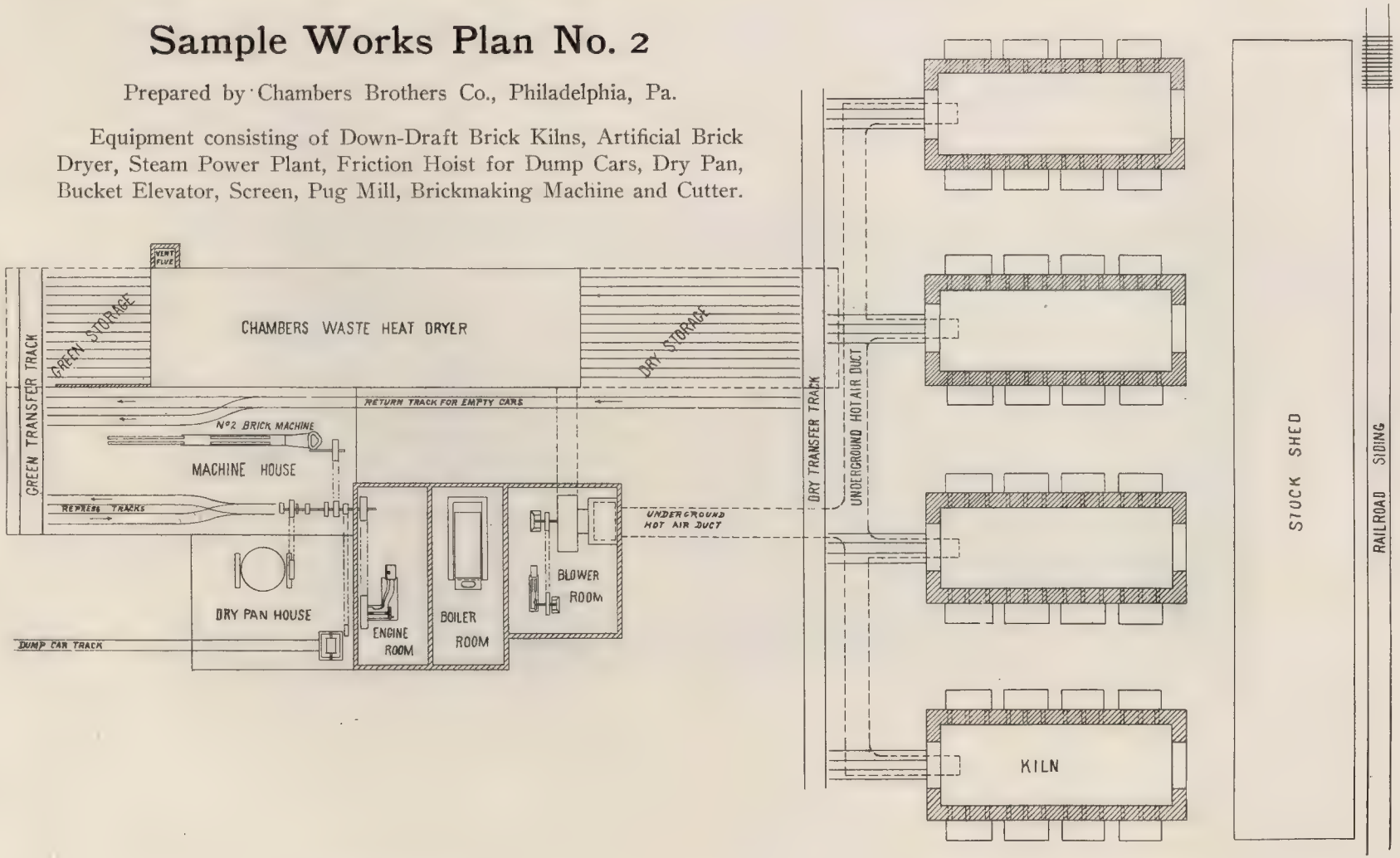
One of the first machines erected is still in operation, and giving such satisfaction that the owner has not been induced to part with it. When his increasing business demanded another brickyard, he bought from us a *second Chambers Machine.*

Many of our customers who started with one machine have doubled, some trebled and quadrupled, their facilities by additional purchases of Chambers Machines.

Sample Works Plan No. 2

Prepared by Chambers Brothers Co., Philadelphia, Pa.

Equipment consisting of Down-Draft Brick Kilns, Artificial Brick Dryer, Steam Power Plant, Friction Hoist for Dump Cars, Dry Pan, Bucket Elevator, Screen, Pug Mill, Brickmaking Machine and Cutter.



FOR ELEVATIONS SEE 49 B 100

FOR PLAN OF MACH'Y 49 B 101

83 C 9

The Ring-Pit Tempering Wheel for Grinding Clay for Molding by the Hand Process

Chambers

Clay Working Machinery

Philadelphia, Pa.